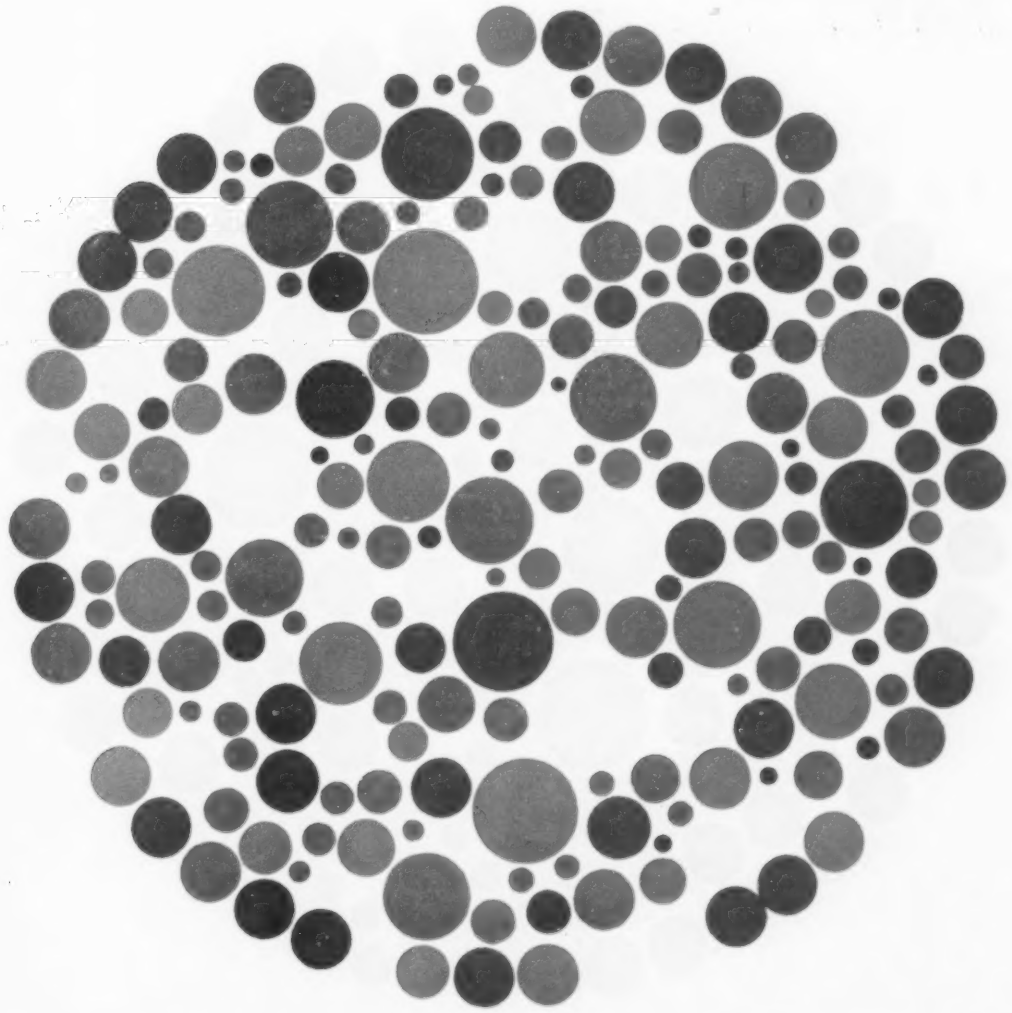
RUBBER and PLASTICS WEEKLY

VOLUME 141 NO. 2 JULY 8 1961 ONE SHILLING



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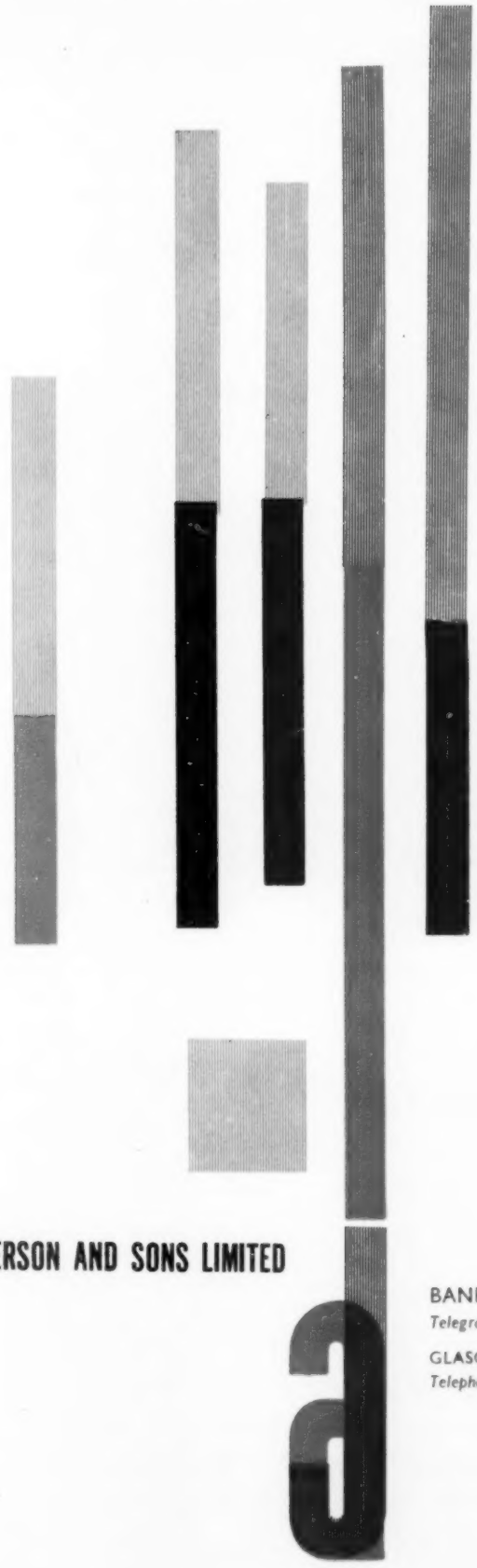

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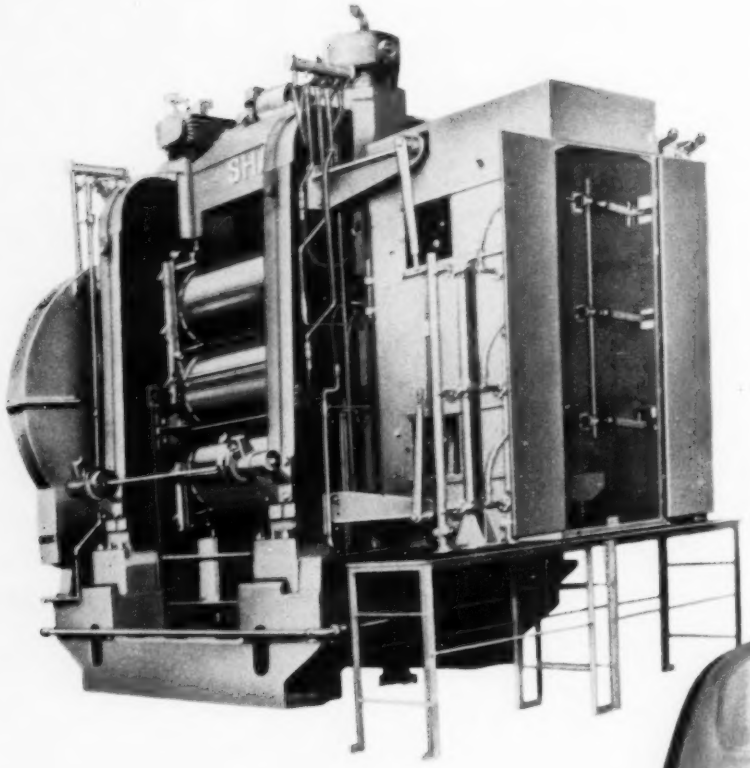

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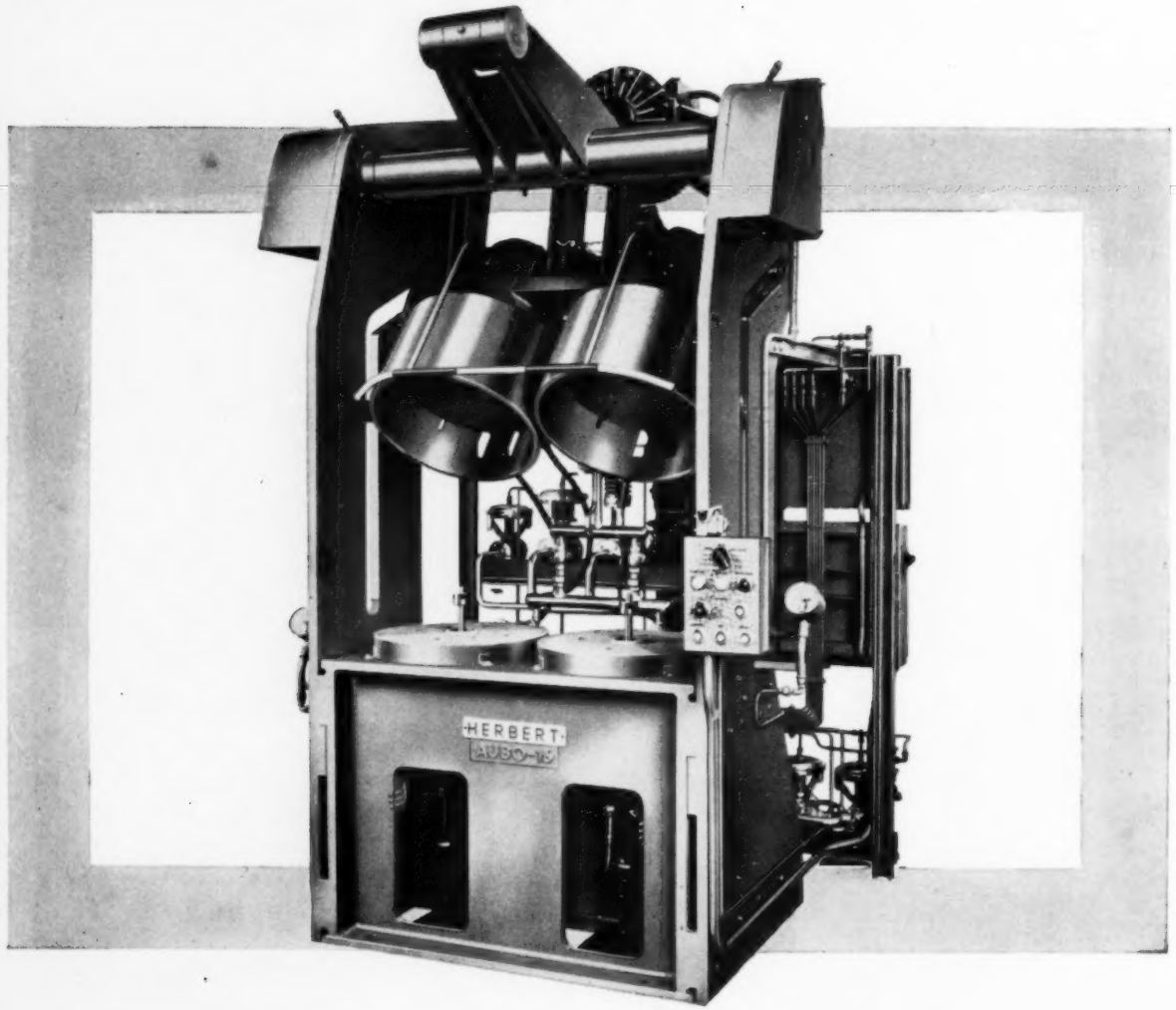

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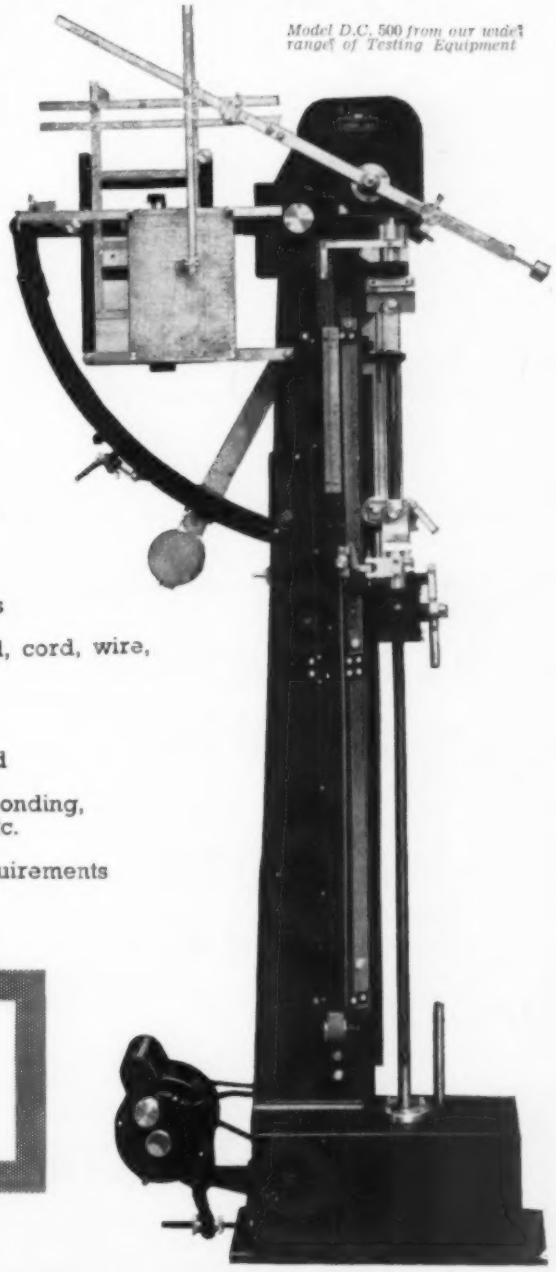

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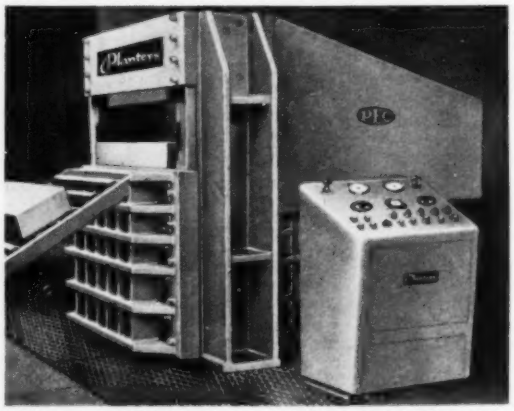

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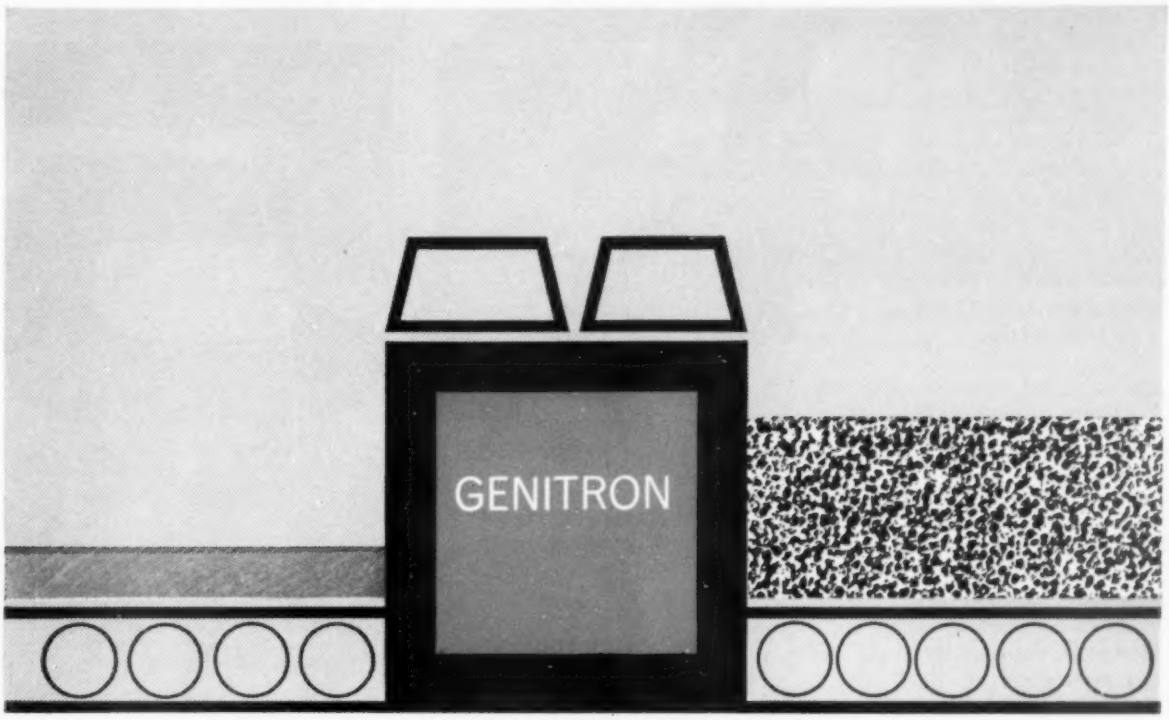

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RUBBER and PLASTICS WEEKLY

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Volume 141 *IN ITS 77th YEAR* **No. 2**

July 8 1961

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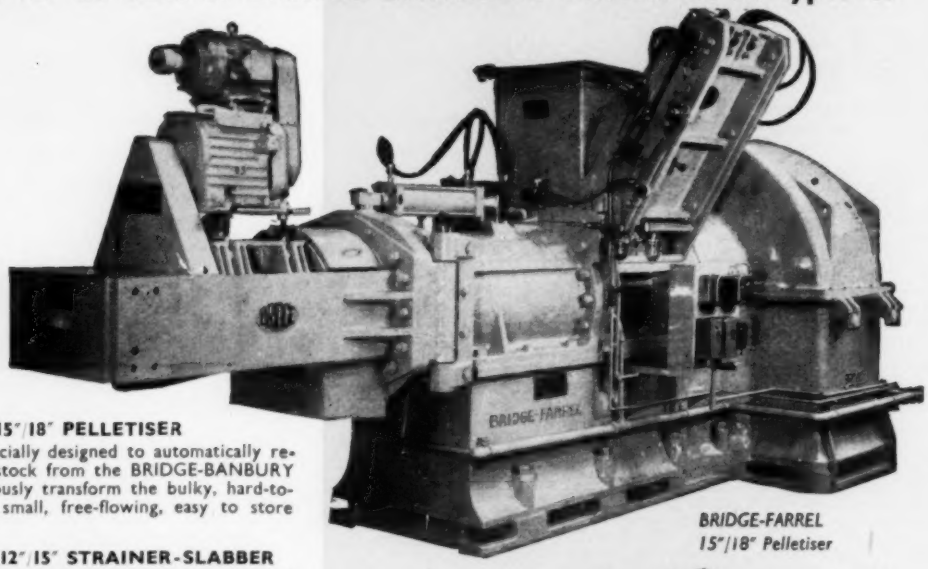

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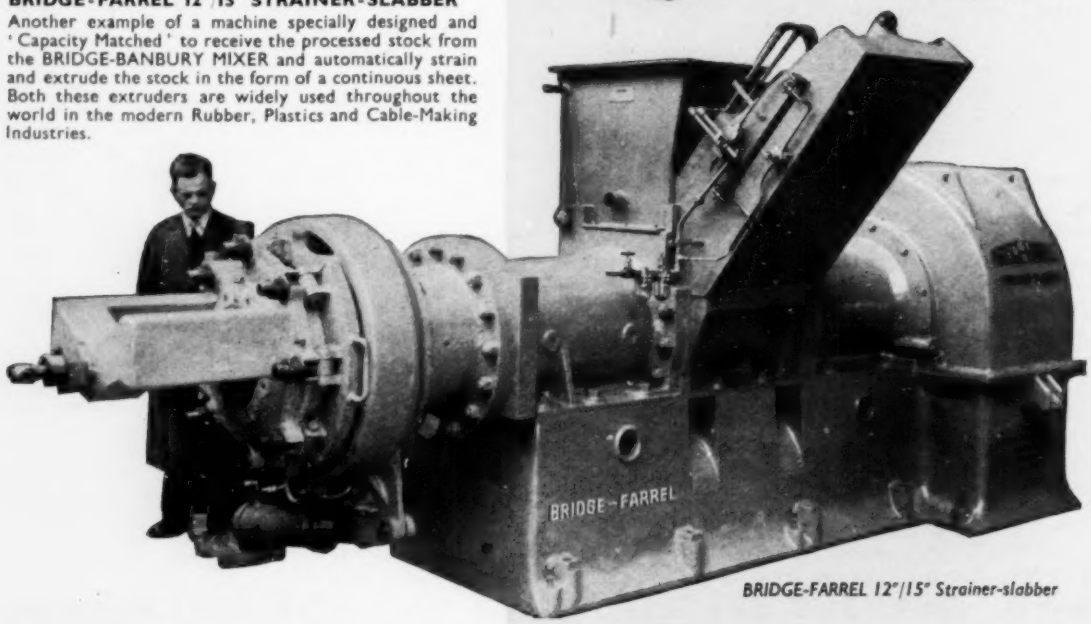

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NOTES of the WEEK

Science and Industry

COMMUNICATION between science and technology on the one hand and industry on the other is of the first importance, particularly so far as smaller firms are concerned. A pure research programme, with no obvious commercial applications, may be carried out at a university and later pigeon-holed and forgotten. Eventually, however, this piece of research may contain the solution to a small firm's problem. But the firm has no access to the research, does not even know that it exists. How can the two separate pieces, the problem and the research, be slotted together?

A very interesting organization for doing just this is the Manchester Joint Research Council. This, the only council of its kind in the country, is a co-operative effort between the University of Manchester (which includes the Manchester College of Science and Technology) and the Manchester Chamber of Commerce. It deals with many aspects of the relationship between science and industry, and a recent innovation is a free technical information service, which operates with the aid of a grant from the Department of Scientific and Industrial Research. This service puts firms with technical (and other) problems in touch with suitable sources of information. These sources include, for example, the 52 research associations — such as our Rubber and Plastics Research Association — and the DSIR research stations.

Although the service has only been running for a short time, it has already dealt with a wide range of problems. One rubber firm required expert advice on the possible use of radio isotopes to determine the dispersion of one component in a rubber compound. The information service arranged for a working party from the Atomic Energy Research Establishment at Harwell to go to the firm for a detailed technical discussion. Another case history concerned a manufacturer who wished to run pvc on a modified rubber extruder, and required to know how to protect the head against possible attack by HCl if there was any thermal degradation of the pvc. The firm was advised what precautions to take and where the necessary work could be done commercially.

Although similar information services do exist in other parts of the country, most areas have nothing on the same scale as this joint research council. Perhaps this is another case where what Manchester thinks today the rest of the country thinks tomorrow. If so, then we hope that tomorrow comes quickly.

Keep your Head

AT British Titan Products' Grimsby plant a damaged section of wired glass roof light, twice the size of this journal, was dislodged by vibration. It fell 30ft. and struck a process operator on the head — or rather, fortunately, on his safety helmet. He was able to carry on working. This process operator is now one of the first members of a new club — called the 'YZ' club — which has been organized by the Royal Society for the Prevention of Accidents. This club is based on a very realistic idea: it recognizes that, while employers have become much more safety conscious, and more diligent in supplying protective clothing, ultimately employees are responsible for their own safety. Unless this responsibility is stimulated, the accident rate can never be successfully cut down.

The object of the club is to encourage employees to take a greater personal interest in this prevention of industrial accidents, and membership is restricted to industrial workers who, by wearing a safety helmet or hard hat, have saved themselves from a bad head injury.

In 1959, 14,547 workers were injured by falling objects, and 72 died. A high proportion of these accidents — 9,029 — resulted in injuries to the head. So the growth of this new club will certainly be watched with interest; its motto might well be a serious variation on the hatters' slogan: 'If you want to keep your head — wear a hat'.

Discovered in Russia

YESTERDAY (July 7) a miniature Soviet Union opened in Earls Court, London. Like the recent British Trade Fair in Moscow, the Soviet exhibition is a trade and industrial display. Visitors from the rubber and plastics industry may be surprised to hear (as a press release puts it) of a 'new material, polycarbonate, recently discovered by Soviet chemists', and also of 'another type of plastics with analogous physical properties, polyformaldehyde, again obtained for the first time in the Soviet Union'.

But, this sort of attribution of discoveries aside, the exhibition reflects the startling growth of Soviet technology. It may be uneven — Russian technical literature can be erudite at one moment and surprisingly naive in the next — but much has been achieved. I.C.I. may be supplying a polythene plant to Russia; but now the stage has been reached when Russia is in a position to supply technical information to I.C.I. (Earlier this year I.C.I. negotiated to buy a Soviet process for nylon 6, but no agreement was reached.)

NEWS *Briefs*

USA $2m. RESEARCH CENTRE—PETROCHEMICAL PLANT FOR TURIN?—ARGENTINIAN AGREEMENT BRAZILIAN RUBBER FIRM INCREASES CAPITAL

●**Argentina** — Laporte Titanium Ltd., a subsidiary of Laporte Industries Ltd., has entered into an agreement with the Argentine company, Titanit Compania Industrial de Pigmentos y Afines SA, to provide technical assistance and advice to enable it to modernize and extend its plant. Titanit, sole manufacturer of titanium oxide in Argentina, has been manufacturing the chemical for some years in a small plant at Pilar near Buenos Aires. The arrangement is on a royalty basis and there is no agreement for financial collaboration between the two companies.

●**United States** — A $2m. research centre is to be built at Houston, Texas, by United Carbon, it has been announced by John H. McKenzie, vice-president of research and development. 'The new centralized facilities will enable United to better co-ordinate its research and development work in the carbon black, synthetic rubber, polymer and petrochemical fields', Mr McKenzie said.

●**Canada** — Catalytic Construction Ltd. has been awarded a contract by Polymer Corp. Ltd., for the engineering, procurement and construction in Sarnia, Ontario, of Polymer's planned polybutadiene plant. Construction is planned to start this summer and to continue through the winter, with completion scheduled before the end of 1962. The contract is connected with the $9m. expansion and improvement programme at Sarnia announced by Polymer earlier this year.

●**France** — United Carbon France SA, subsidiary of the American company, has completed its new carbon black plant at Port Jerome, France. Reactor shakedown trials have been completed and commercial production has begun. The new $5m. plant will produce 50m. lb. of furnace black a year. Port Jerome is the centre of the French rubber industry, as well as an area where oil feedstocks are readily available. The black plant is said to be the first in the Common Market to use fuel oil as a raw material.

●**Brazil** — Resana SA Industrias Quimicas, of Sao Paulo, has increased its capital from Cr. $45m. to Cr. $60m. and will shortly make a further increase to Cr. $70m. The company intends to expand its production of thermosetting resins. Last year the company began production on sebacic acid extracted from castor oil under licence from Wallace and Tiernan Inc., USA.

●**Belgium** — Peco Ltd. states that all the machines were sold from its stand at the recent Europlastica 1961 Trade Fair in Ghent. Keen interest was shown in the firm's Rotothrust screw preplasticizing injection moulder. 84% of the exhibitors were from Common Market countries.

●**Malaya** — Proposals that Britain should join the European Common Market have not been opposed by the Malayan Government, according to usually well-informed sources in Kuala Lumpur. Official Malayan and British circles remained silent during this week's visit of Peter Thorneycroft, Minister of Aviation. Mr Thorneycroft is now holding discussions in Ceylon.

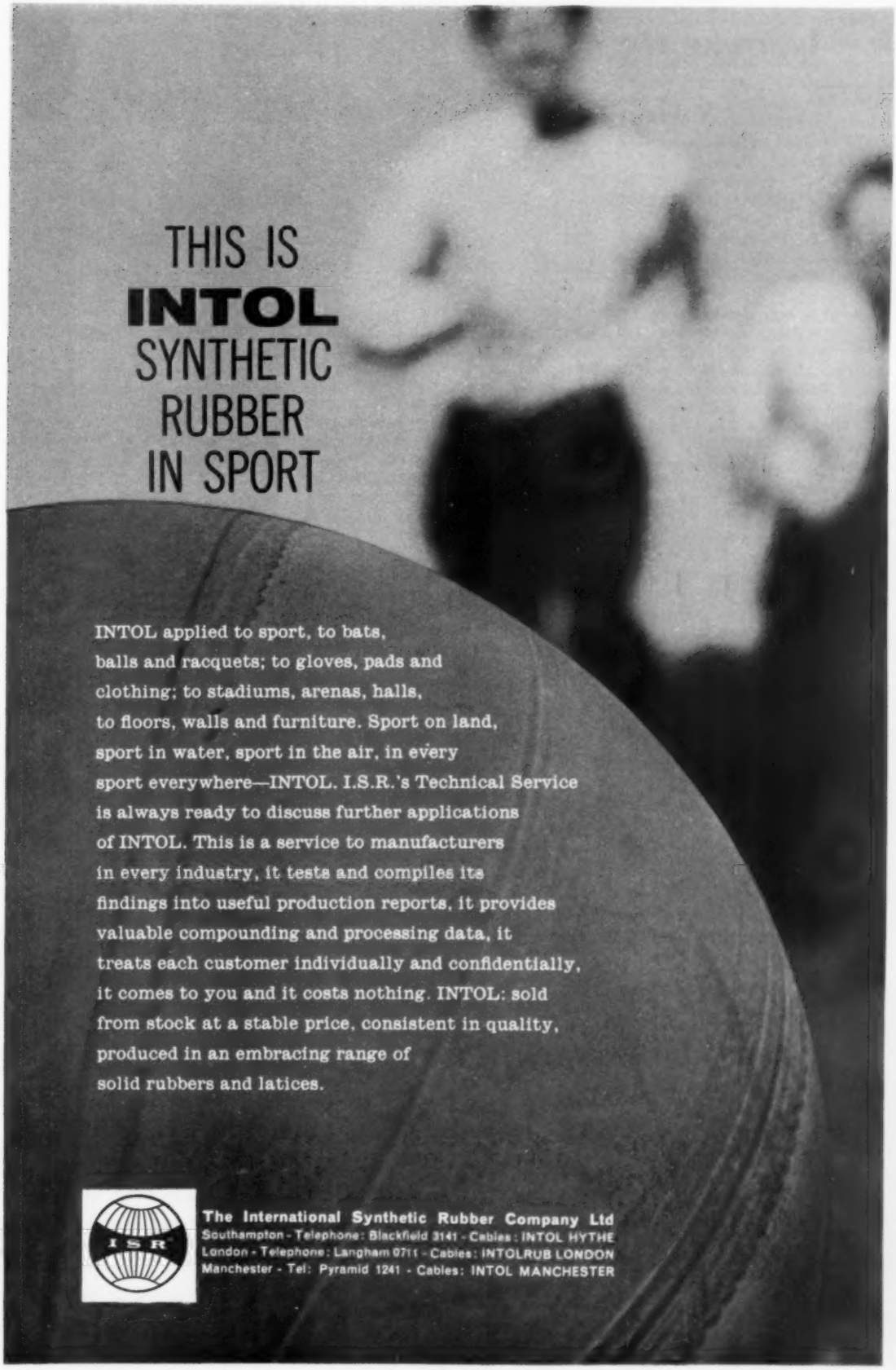
●**Italy** — Rumianca of Turin is planning to establish a petrochemical plant in Sardinia, to be completed by 1964. Facilities will also be erected to produce electrolytic chlorine. Plastics that will be produced include pvc and polythene.

●**West Germany** — An aromatics plant is to be constructed at Dinslaken by the Standard Oil Co. of California and British Petroleum. The plant is scheduled to go on stream by the middle of 1962, and will have a design capacity of 14,000 tons of paraxylene, which is the key raw material for polyester fibre. The venture will be operated by a newly formed partnership, Deutsche BP und California. The contract for the construction of the plant has been awarded to the German firm of Lurgi.

●**Brazil** — Vulcan Artefatos de Borracha SA, of Rio de Janeiro, has increased its capital from Cr. $15m. to Cr. $75m. The firm is the largest producer of foam rubber in Brazil. One of its shareholders is Union Carbide Inc.

●**Belgium** — Examination of the neoprene bearing support pads installed three years ago in the Centre International Rogier, Brussels, has shown that there is no sign of deterioration and the maintenance engineers expect them to last the life of the building without repair or replacement. These bearing pads were first installed in the commercial centre under the main girders and subsequently under the façade girders on the second floor. They withstand the expansion and contraction of the concrete and metal structures and avoid the appearance of cracks in the building.

'Our transatlantic visitors don't appear to be unduly impressed with our new production set-up!' — 544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New Isocyanate Plant

DU PONT EXTENDS FACILITIES AT MAYDOWN

AS reported in *RPW* (July 1, 6) new plant is to be constructed at the Maydown, Northern Ireland site of Du Pont Co. (UK) Ltd. for the production of isocyanates. This multi-million pound project is the second manufacturing unit to be built by Du Pont in the UK and will be on the 360 acre site, on the shores of Lough Foyle near Londonderry, partly occupied by the company's neoprene plant. The neoprene unit, which has a capacity of 50m. lb. came on stream in May 1961.

Construction of the new plant is expected to commence before the end of this year and production is scheduled to begin in late 1963.

With the exception of some supervisory and technical personnel, labour for both construction and operations will come primarily from Northern Ireland. Peak construction force will be about 500 and the plant, when complete, will provide work for some 125 employees.

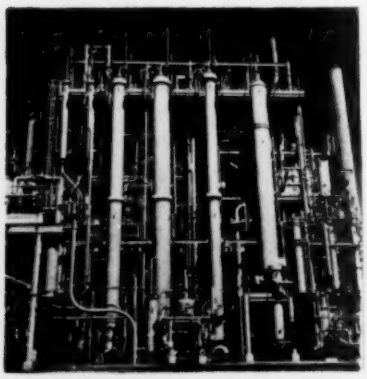
Commenting on the announcement of the project, which was made in London on June 29 by W. H. McCoy, Managing Director of Du Pont UK, John Andrews, Northern Ireland Minister of Commerce, said that the news would be received with enthusiasm in Ulster. He said that the decision to extend facilities at Maydown was evidence of the immediate success of the neoprene project and showed that the local workers were able to match up to the skill required by this most modern of industries.

Organic isocyanates are manufactured by Du Pont under the trade name Hylene, at its plant in Deepwater Point, New Jersey. Until the Maydown unit is completed material from the USA will be exported to customers in the UK and in countries in the EFTA, which are the markets to be served by the new plant.

The major use of Hylene isocyanates is for the production of both rigid and flexible urethane foams. The rigid types find a wide range of applications for refrigeration and insulation while the main outlet for flexibles is for cushioning and more recently for foambacks, where they are used in conjunction with fabrics to produce light but warm clothes.

This new plant is the sixth manufacturing facility to be announced by Du Pont's European subsidiary and affiliated companies in the last five years. In addition to the British subsidiary, Du Pont has other European subsidiary companies in Belgium, France, The Netherlands, and Switzerland, and has entered into a joint manufacturing venture in Western Germany. In Belgium the Du Pont subsidiary operates a paint plant at Malines. In The Netherlands work is nearing completion of production facilities for Orlon acrylic fibre at Dordrecht, and construction is expected to get under way shortly for a plant to process Delrin acetal resin.

Aerial view of the Maydown works of Du Pont (UK) Ltd. Construction of the new isocyanate plant for the manufacture of Hylene on the same site will start later this year



Du Pont's Hylene plant in New Jersey, which was completed in January 1956 and has an annual capacity of 25m. lb.

New Rubberized Road Seal Developed

OPENING the new Maltby Bypass at Victoria, Australia, the Premier of Victoria, H. E. Bolte, referred to a new type of rubberized bitumen seal used on the bypass.

The Australian office of the Natural Rubber Bureau states that the new additive mentioned consists of a solution of Malayan rubber and power kerosene (paraffin) mixed with bitumen.

The light rubberized seal used on the bypass will enable any weaknesses in the road formation to be discovered before the more expensive permanent surface is laid down. It was selected on the strength of its performance elsewhere in Victoria under adverse conditions and heavy traffic. The extra tenacity of the rubberized bitumen and its resistance to bad weather during laying helped to overcome the problems of carrying out the programme in mid winter.

In the sealing operation, the consolidated pavement was primed with a blend of vertical retort tar and tar oil before sealing with one-eighth of a gallon of rubberized bitumen per sq. yd. and was then covered with three-eighths basalt chippings.

In earlier work carried out with rubberized bitumen by the Country Roads Board, the rubber additive has generally been in the form of a powder added to the bitumen in heater kettles and then loaded to the sprayer and cut back with power kerosene. This method required approximately 40min. to dissolve and disperse the rubber powder.

The new solution is made from a specially selected rubber of known physical properties, treated to give a free flowing solution of standard viscosity when dissolved in power kerosene. The solution consists of approximately 20% of rubber and 80% power kerosene.

Another Tyrex Yarn

Courtaulds has introduced a new improved Tyrex yarn intended primarily for the tyre industry. The yarn will be called Tenasco Super 140.

Death of C. H. Glassey

PLASTICS INDUSTRY LOSES AN OUTSTANDING FIGURE

ONE of the most outstanding figures in the UK plastics industry, C. H. Glassey, chairman of British Industrial Plastics, died on Monday (July 3). Mr Glassey, who

was president of the British Plastics Federation from April 1 1959 to March 31 1961, had been ill for some time. He was 71.

Charles Henry Glassey joined the British Cyanides Co. Ltd. (later to be known as British Industrial Plastics Ltd.) in July 1907 at the age of 16 as a junior works chemist, on leaving King Edward VI School, Aston, Birmingham.

When he was 23 British Cyanides made him works manager of the newly formed British Potash Co. Ltd., in which the Government had a substantial interest. When British Cyanides turned its attention to plastics in 1925 and formed the Beetle Products Co. Ltd., Mr Glassey became actively engaged on the experimental and production sides. Later he was made sales director.

He was appointed a director of British Industrial Plastics in 1937, managing director of the BIP group of companies in July 1949 and chairman in 1959.

He was elected the first chairman of the Midlands section of the Plastics Institute in 1932, continuing in 1933, and became chairman of the council in 1934.

During the 1939-45 war he served as deputy controller of the plastics control of the Ministry of Supply, until his resignation in 1943. He was active on many of the British Plastics Federation committees between the years 1943-49, and was chairman of several of them. He relinquished his membership of these on being appointed managing director of BIP.

Mr Glassey was elected a member of the Worshipful Company of Horners in the spring of 1951 and joined the City Livery Club in 1958. Following the merger earlier this year between Turner and Newall Ltd. and BIP Ltd. he was invited to join the Turner and Newall board.

NR Surplus?

Leading rubber manufacturing sources in New York are predicting that, exclusive of a release of natural rubber from Government stockpiles, there will be a natural rubber surplus this year. Estimates of the surplus range from 10,000 to 30,000 long tons.

Leonard Smith, commercial research director of the US Rubber Co., predicted that world consumption this year would reach 1.990m. long tons. He estimated world production at slightly more than 2m. long tons.

Mr Smith based his consumption figure on natural rubber purchases this year by the Soviet-Chinese Bloc of 450,000 long tons, 60,000 long tons more than the bloc bought in 1960.

No Stockpile Sales

There were no sales from the Board of Trade's stock of natural rubber during June and 26,590 tons of rubber remain available for sale, the Board of Trade announced on July 3.

Low Level of GSA Sales

The US General Services Administration has also recorded low June sales of crude natural from its stockpile — they totalled only 708 long tons.

GSA said that approximately 110,117 long tons had been sold from October 16 1959, when sales began, to June 30 1961. The agency added that at the end of June 1961, there remained for sale about 351,883 long tons of crude rubber.

The GSA announcement listed the approximate quantities of crude rubber remaining for sale as follows (long tons): No. 1 RSS 202,604; No. 2 RSS 44,758; No. 3 RSS A 75,185; pale crepe 29,336.

Hose for Home Office

BTR Industries Ltd. has received a £300,000 contract to supply the Home Office with more than 65 miles of Plastidry fire-fighting hose.

This hose, of 6in. bore, consists of a Terylene woven reinforced fabric to which is fused a cover and lining of pvc compound, and will be used for emergency fire-fighting purposes.

macroPlastic Rearrangement

THE EFTA plastics association has agreed to recommend to their members to support three fairs during 1962 and 1963: macroPlastic, Utrecht (October 18-25 1962); Interplas, London (June 12-22 1963); and Kunststoffe, Dusseldorf (October 19-22 1963) (*RPW* July 1, 6).

MacroPlastic was to be held in 1963, and the organizers, NV 't Raedthuys of Amsterdam have now issued some details of the rearranged exhibition. As in 1960, it will be held at the Croeselaan site at Utrecht, and it is expected to be 50% larger than the previous exhibition. In conjunction with the show an International Plastics Congress will be held at the Royal Tropical Institute at Amsterdam. The theme of this will be 'Plastics and Problems of Choice', dealing with the problems of choosing the right type of material, with regard to technical properties as well as economic and technological considerations.

Reasons for a Decision

'The decision to hold the exhibition a year earlier than originally intended . . . made it necessary to organize macroPlastic either a year before or a year later', say the organizers. 'A period of four years between two macroPlastic exhibitions was considered too long in view of the dynamic developments in the Netherlands plastics industry . . . so it was decided to hold the macroPlastic exhibition a year earlier'.

Stokes Manufacturing Machinery in UK

The F. J. Stokes Corp., of Philadelphia, USA, has formed a UK subsidiary to manufacture its compression moulding machines. Production of Stokes equipment is already taking place in association with Thomas White and Sons, of Paisley, Scotland.

The machines will be marketed in the Commonwealth and EFTA countries, as well as the UK.

The directors of the new subsidiary are Allan A. Hutchings (US), vice-president in charge of sales, F. J. Stokes, jun. (US), vice-president in charge of manufacturing for the US company, and Malcolm Scott, of London.

STABILIZERS FOR PVC — PART 2

Methods of Test

IMPORTANCE OF BOTH STATIC AND DYNAMIC ASSESSMENTS

By W. S. PENN, BSc

TESTING is carried out for two principal reasons (a) to examine the efficiency of a new stabilizer and (b) to check the stability of a compound containing a stabilizer and all other ingredients. The two ideas are rarely separated, except perhaps by suppliers, but they should be kept in mind.

It follows that there is no test for a stabilizer unles it is mixed in a compound. In other words there is no inherent property of a chemical which can be measured and the value obtained to say that the stabilizer occupies such and such a place in the scale. Suppliers invariably test new products in compounds, the reasons for which will become obvious.

Perusing the last thought there seems to be no reason on theoretical grounds why chemicals should not be examined chemically and physically to determine their potential value as stabilizers. After all, it is usually possible to predict that a chemical will behave as a stabilizer although its detailed properties cannot be forecast. Thus reaction with HCl and an examination of the properties of the resultant products should give much information on the properties of the potential stabilizer. Obviously there is much scope for work of this kind. In the meantime the properties of stabilizers continue to be examined in compounds since it is not only a question of reacting with liberated HCl (and the other reactions described in Article I) but a question of avoiding interaction with polymers, plasticisers, fillers and impurities.

UV Light Absorbers

Some work on the laboratory properties of UV light absorbers has been carried out and the results confirmed in actual pvc compounds. It has been shown that those materials which absorb light in the 300-400mμ wavelength region (*i.e.* the ultraviolet portion of sunlight) act as effective UV light screens in pvc compounds.

This makes the search for UV light screens so much simpler because practical tests are both long and frustrating. The usual methods are to expose suitable pvc compounds out-of-doors for long periods, preferably in a place having much sunlight, to use UV lamps or the so-called fade-O-meters or weatherometers. All of these work on the principle of exposure to UV light, often on an intermittent basis to simulate actual conditions of day and night with alternate heating and cooling cycles, and with simultaneous spraying with water.

There are two principal methods for measuring the stability of pvc compounds and consequently the efficiency of stabilizers in them. A simple laboratory test consists in determining when the first traces of HCl are liberated and a more refined test consists of following colour changes in compounds. The latter may be divided into two whereby the technique is used first statically and then dynamically.

Mixing Techniques

The stabilizer is not normally added in any special order during premixing except that it is added before the plasticiser. In other words the mix is made by (in the laboratory) adding the polymer followed by stabilizer, colour, lubricant and fillers to a mortar and blending thoroughly. A crater is then made of this powder into which some plasticiser is added, until it is absorbed, followed by more plasticiser and so on until it is all absorbed. The mixture is then thoroughly blended and is ready for 'fluxing.'

The mill rolls should be warmed to about 140°C — 150°C before the addition of the pre-mix. When this is done, with a fairly tight nip at first, any material which falls through the nip should be swept up and added quickly to the rolling bank. The back roll should be preferably 5°C — 10°C cooler than the front roll and should be run faster with a minimum friction ratio of 1.1 : 1.0. The temperature should be allowed to build up to about 160°C during mixing which will take 6-10min.; the mix should be cut about and should finally be up-ended several times and then slabbed off.

The sheets of compound thus formed, usually about .060in. thick, may be cut directly into strips ready for use. They can, of course, be pressed if required (but see later) and if this is done a pressing time of 5-6 min. at about 160°C and a pressure of 0.5-1.0 ton/sq. in. is usually adequate.

The greatest problem with laboratory work on stabilizers is to obtain consistent results. In particular it is important that the 'heat history' of the compounds is identical. There is no point in carrying out controlled heat ageing tests to check the stability time if the compounds have already been subjected to varying heating periods during mixing. Thus the time and temperature of each operation should be the same as far as possible, is best to keep the heat history as short as possible so that it is usual to test the 'hide' off the mill rather than subsequently press cure it.

Apart from this the pre-mixing routine and mill-mixing routine should be the same as far as possible, the following being some factors for guidance.

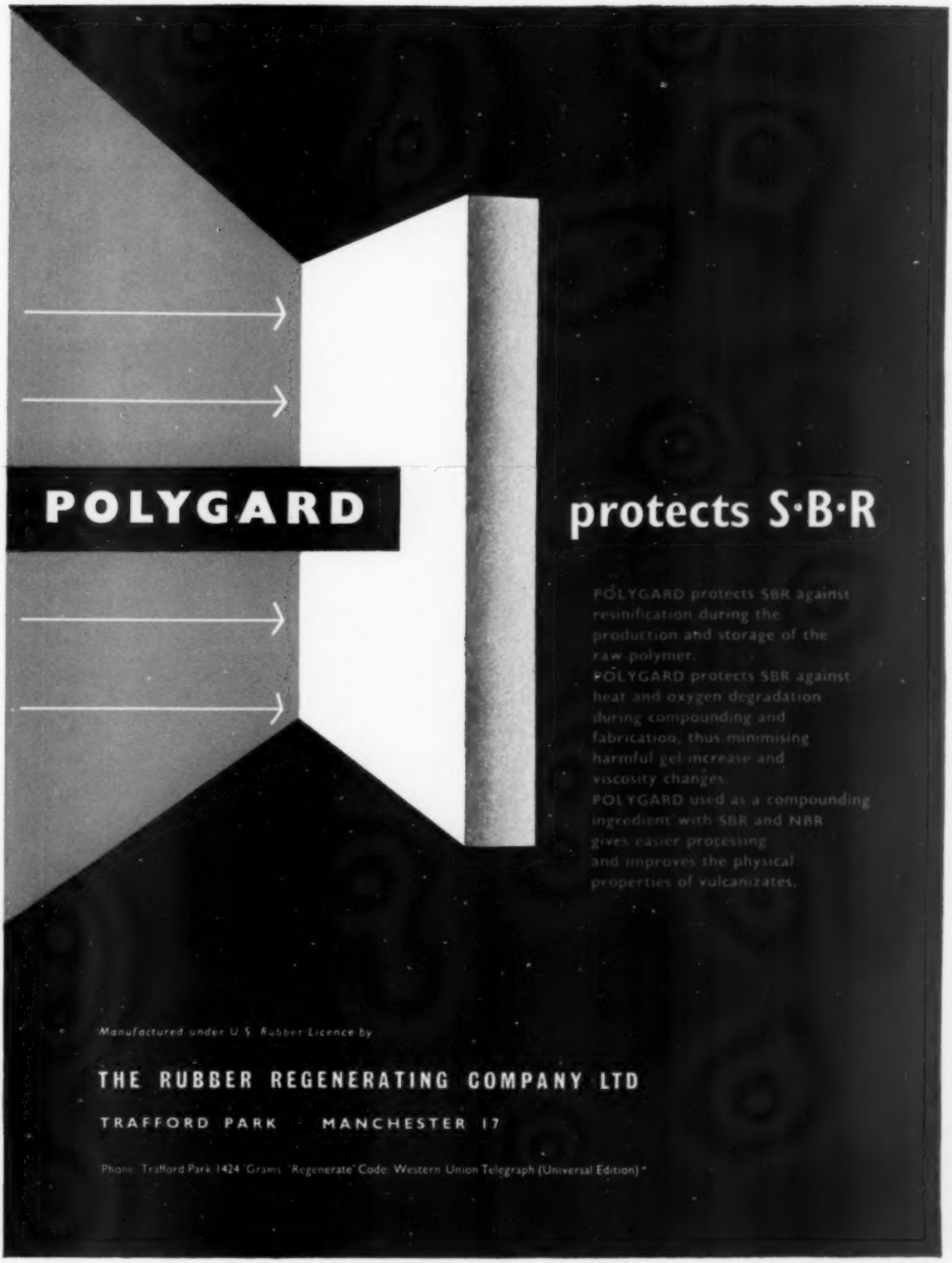
1. Weigh out sufficient materials to give the same batch weight (in each experiment) and the optimum batch weight for the mill. 2. Add the ingredients to the pre-mix in the same order and mix for the same period. 3. On the mill open the nip at the same rate; mixing times and temperatures to be the same; cut about and up-end the same number of times. 4. Sheet off to exactly the same thickness.

With every series of mixes compared a standard should always be used. This is because the colour of the 'blank' can often vary from mix to mix.

Laboratory Test

This is a very simple and convenient laboratory test which can be recommended for quick routine tests. The method can be used for chips received direct from the suppliers, cut up mouldings or cable strippings, or strip compound straight from the mill.

The pvc should be cut up into a convenient form and placed in the bottom of a medium-sized test tube. Next make a Congo Red solution and in it soak some filter paper. This Congo Red paper is then cut into strips and one is suspended about one inch above the pvc. The top of the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tube is then lightly sealed with cotton wool.

The idea is now to heat the tube at a definite temperature and determine how long it takes for spots of blue to appear on the paper. These are, of course, caused by the decomposition of the pvc with the liberation of HCl. The differences in time determine how successful the stabilizer is in delaying the ultimate disintegration.

The test is as simple as it sounds except that there is perhaps a little difficulty in deciding the temperature to use. A value of 180°C is common and with basic lead carbonate a result might be obtained in eight to ten minutes. Unfortunately with such a rapid reaction the test is not very discriminating. As the temperature is lowered the time for reaction becomes very much longer so that at say 160°C the test loses its rapid nature. Each observer must decide for himself which temperature is most suitable but whatever it is, it must be achieved in a thermostatically controlled bath.

This test is very useful for routine purposes. Every time a batch of pvc is made or a consignment received from an outside firm it is possible to carry out a quick check on the stability. It can easily be established by experience what test time can be considered to give a satisfactorily stable compound. The test may, in fact, be used as easily and as usefully as a simple gravity test.

Oven and Press Tests

These two tests are grouped together since they give almost identical results. Both are based on the changes of colour which take place when pvc is degraded.

In the oven test the pvc is in effect, moulded for varying periods of time, obviously to a certain extent in the absence of air. Thus the secondary oxidative reactions are limited and differences between the oven and press tests could well exist. In fact in certain instances these differences can be observed but since the oven test is the most common nowadays the deviations need not be pursued. In carrying out the press test, however, it is absolutely necessary to use clean and polished moulds.

The oven test is very simple but, as in the mixing of compounds, attention to detail and consistency is of the highest importance. In the first place the oven must be of the circulating type where the air is changed at regular intervals and the temperature is as constant as possible. Even so the temperature variations are likely to be such as to cause differences in colour formation since it is so sensitive to changes of even 2 or 3°C. It is, therefore, necessary to keep all the test pieces as close together as possible, avoiding places where 'dead' pockets of air are likely to occur. As in milling a standard sample must be used with any series of tests.

As in the case of the laboratory test the temperature for reasonably quick results is 180°C. A complete range of colour changes can take place in between 15 and 120min. For the test the samples are cut from sheets off the mill all to a standard thickness (from .05in. to 0.10in.) and all to a standard size (1in. x 1in. to 1in. x 2in.). Enough of them are placed on individual aluminium strips or preferably gauzes, so that one can be removed at regular intervals, say 10-15min. and the colour change determined. For this purpose it is essential to use a port-hole through the oven door; it is not really good enough to open the main door as temperature conditions afterwards take a considerable time to settle down.

The simplest but most unsatisfactory method of recording results is to note the colour change and this gives a rough indication of the degree of change. The best way to do it, as described by Moorshead,[1] is to assign a numerical value to a series of standard strips previously prepared. A suitable sequence is as follows:

0 = Clear
1 = Barely detectable change
2 = Very slight change
3 = Faint tinge of yellow
4 = Pale yellow
5 = Yellow
6 = Faint tinge of red
7 = Pale red
8 = Red
9 = Deep red
10 = Very deep red/black
11 = Black

It is not always easy to decide which category a colour falls into and errors of judgment will clearly be made. It is therefore important to use the same observer for any series of tests but if this observer makes errors they will usually be consistent and the overall picture will be clear.

Some results based on the above techniques will illustrate its value. The results in Figure 1 are based on compounds of the following formulae:

A		B	
Resin	100	Resin	100
DOP	50	DOP	50
		Barium stearate	2.5
		Zinc stearate	0.5

C		D	
Resin	100	Resin	100
DOP	50	DOP	50
Barium stearate	2.5	Dibutyl tin	2
Zinc stearate	0.5	Dilaurate	
Abrac 'A'*	5		

*Abrac 'A' is an epoxidized oil manufactured by A. Boake, Roberts and Co. Ltd.

Referring to Figure 1, it will be seen that the rate of deterioration without any stabilizer in compound A is very high. The introduction of a barium/zinc stabilizer system (compound B) effects a threefold improvement and the additional effect obtained on this system by the addition of an epoxidized oil (compound C) is most marked. This effect is important and general. Compound D, employing a tin soap, is also very effective.

It is valuable to take compound C above and see the effect on stability of changing the plasticizer. Some of the results obtained are given in Table 1.

TABLE 1

THE STABILITY OF VARIOUS PLASTICIZERS (USING COLOUR NUMBER)

Plasticizer	Minutes in Oven						
	30	40	50	70	100	110	130
DOP	3	3	4	6	8	10	—
TTP	3	4	6	8	10	—	—
TXP	3	4	5	7	9	10	—
DIOA	3	3	4	5	6	8	10
DOP, no stabilizer	Already 10 at 20 minutes						

The results in Table 1 are most interesting. TTP appears to be the least stable plasticizer although actually, if the work is extended trioctyl phosphate is found to be even worse. Perhaps surprisingly di-iso-octyl adipate gives the best results although DOP (closely folowed by DIOP) is not too bad.

High Speed Milling Test

It is generally known that the relationship between laboratory results and those in the factory is not always close. This applies particularly to stability tests described above since they are static yet in the factory the compounds are processed in extruders and calenders, often at high speeds and temperatures. It would obviously be desirable, therefore, to carry out an extrusion test for extrusion compounds and a calender test for calendering compounds, but unfortunately the correlation between laboratory and factory extruders is not high.

Fortunately is has been found possible to devise a high speed milling test[2] which in particular simulates high speed calendering results obtained in the factory. The test was first introduced by Bakelite Ltd. and some interesting results have been presented by Dodgson and Pike[3] of Durham Chemicals; some of the results are surprising and give a different picture to that obtained with static tests.

The first point to be established is the running conditions of the mill and these are designed to simulate actual calendering conditions. The best temperature was found to be 180°C at which level a result was obtained in about 20 minutes. If the mill can be operated at peripheral roll speeds of

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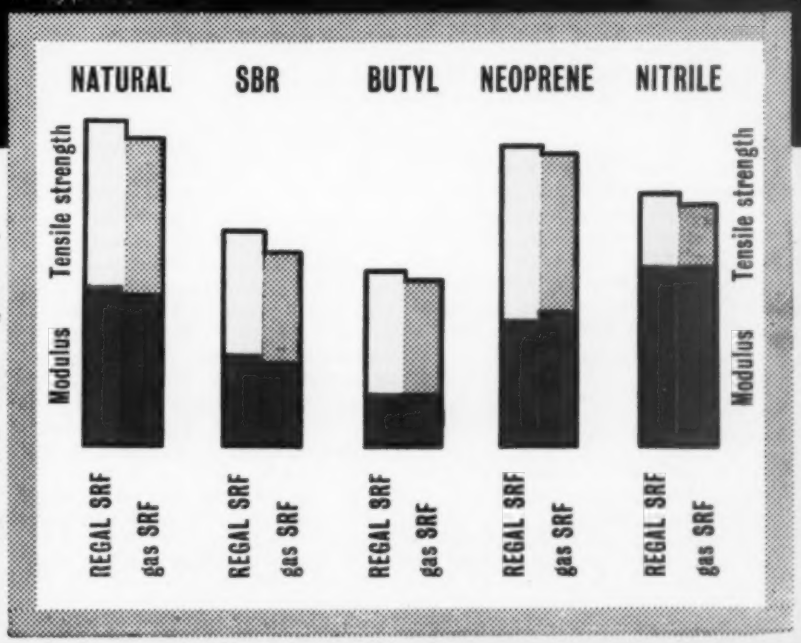

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120ft./min. then so much the better, but high calender speeds can be simulated by the closing of the nip. This should be 0.005in. to 0.050in., the result not varying between these values although if the sheet is exceptionally thick it is likely to stick to the rolls and cause premature breakdown. As far as possible it is advisable to use the thickness at which calendering usually takes place.

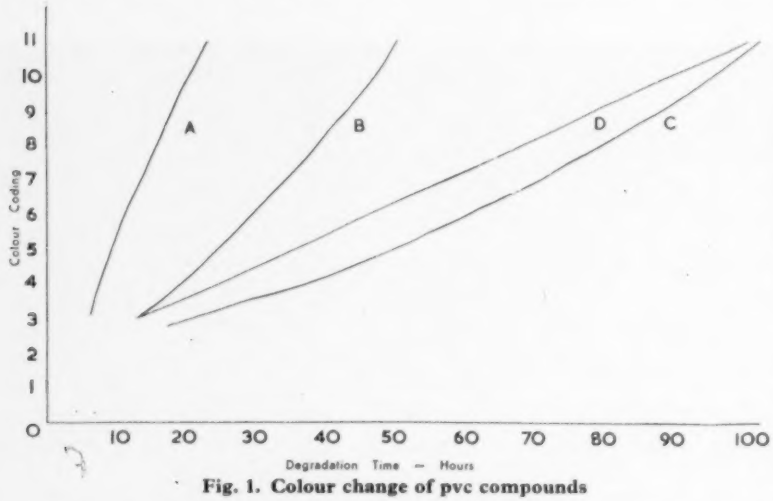

Fig. 1. Colour change of pvc compounds

A sample is taken off the mill every five minutes or so and examined. The test is stopped when breakdown occurs. The results are fairly reproducible, at least as good as in the oven test, to within about two minutes.

Dodgson and Pike carried out a series of experiments to determine the effect of various factors on the test and on the stability of compounds. For instance it was considered that the viscosity of the mix would have a marked effect on the result due to different shearing forces. This, of course, would be expected and is found in the extrusion of pvc, although differences of viscosity are nowhere near as marked as in elastomer processing.

It was found that polymers with different K-values had little effect on the result but this could not definitely be attributed to viscosity differences. Viscosity can be varied much more by variations in plasticizer content. The work was carried out in a compound of the following formula.

Suspension polymer (K = 65) ..	100
Paraplex G65	5
Liquid Ba/Cd stabilizer	2
DOP	25–80
Calcium stearate or stearic acid ..	0.5

The conclusions drawn from oven and milling tests carried out side by side are as follows:

1. The oven test says that variation of the plasticizer content does not affect stability while the milling test indicates that the higher the plasticizer content the higher the stability.

2. In the oven test calcium stearate delays breakdown which then becomes more rapid and by the milling test this stabilizer is only effective at 20 parts plasticizer.

3. Both tests show that stearic acid is more effective in delaying breakdown than calcium stearate.

4. The oven test fails to determine the effect of lubricity whereas the milling test shows that failure by lack of lubricity is more important than colour degradation.

Test Differences

It is important to note the differences which are shown up between the two tests. The difference is even more striking than at first sight since it appears that the results obtained by the milling test reproduce those obtained during actual calendering.

The differences between the various methods of test can best be seen graphically. Figure 2 shows the variation in concentration of a liquid Ba/Cd stabilizer system. As it happens in this case the slopes of the curves are approximately similar. The breakdown occurs more readily however in the case of the mill test.

There are many other conclusions which have been drawn from the milling test the most important of which are listed below. It should be stressed, however, that these results do not necessarily apply to any process other than high speed calendering.

1. The stability imparted by soaps is increased with increasing fatty acid chain length.

2. The octoates fail on lubricity tests particularly at high plasticizer levels.

3. In the stabilizer series barium/cadmium laurate 2 : 1, barium/cadmium laurate 1 : 1 and barium/cadmium laurate 1 : 2, the milling test shows no difference in stability. However, the oven test shows increasing stability with increasing cadmium content although the difference is much less obvious in the presence of epoxy resins.

4. The milling test reaches some important conclusions regarding the use of epoxy resins. The oven test shows improving stability with increasing epoxy content. There is also an improvement in the initial yellowing up to 1.5 parts but above this there is an adverse effect on it. The milling test also shows improved heat stability but shows no improvement in initial yellowing at any epoxy level.

5. The question of initial yellowing with epoxy resins is an important one and needs to be investigated more particularly in view of the otherwise outstanding advantages to be gained by using the materials. The conclusions in 4 above were reached with 50 phr phthalate plasticizer with 2.0 phr barium/cadmium laurate 2 : 1. Similar results were obtained with barium/zinc laurate. The results may not be of general application but, where initial yellowing is likely to be of importance, any compound where epoxy resins are used should be thoroughly tested.

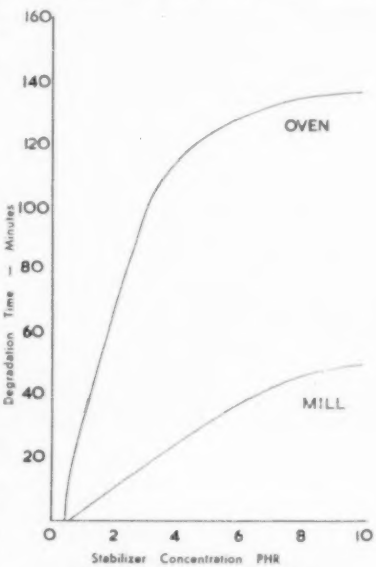

Fig. 2. Mill v. Oven Test

The milling test may be summed up as follows. It is quite rapid, particularly where only one or two tests are required. A series of compounds will take longer to examine by the test, however, than an oven since in the former case only one compound at a time can be treated and in the latter case they can all be treated at once.

. . . in the Organic and Fine Chemicals Laboratory. There are lots of other girls in all sorts of jobs and I must say they all seem very happy at Berk. But I'm told it's always been the same here, ever since we started ninety years ago. I'm a control lab. analyst, testing chemicals used in anything from cosmetics to cleaning agents and in industries as different as agriculture and road building. Part of my own duties is to determine the purity of potassium bromate used in such contrasting end-products as a neutraliser for "cold perms" and an anti-shrink agent for the woollen trade. And I know our chemicals are used in lots of other things—food and soaps and textiles and leather and greases and fuel oil and rubber and plastics. The last two of these, for example, use things called PVC Stabilisers and we supply these six. We call them:

TRIBASE (tribasic lead sulphate)
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The dynamic aspects of the test are most important. The effect of development of heat due to shearing forces is determined which is not so with the oven test. Secondly, lubricity cannot possibly be determined in a static test yet it can easily be on a dynamic test. If a lubricant is not working efficiently then the compound is likely to stick to the mill/calender rolls and this is obviously of the greatest importance.

Conclusions

An effort has been made in the present article to present the most common tests for stabilizers in use today. All have their place in laboratory testing.

The simple laboratory test first described is best used for routine purposes. The oven or press test, usually the former, is the one most commonly used and it is the simplest and best for large scale investigations where many compounds are to be examined.

The milling test (and any similar simulated field trials) is used as a final tool. In other words once the oven test has sorted out a few compounds out of many, the milling test will be used to make a final test of compounds for calendering.

Finally it should be pointed out that all the tests described are for heat stability. Light stability was referred to and UV light tests must be carried out if pvc compounds are likely to be exposed out-of-doors for any length of time. UV lamps and out-of-doors tests are the most common methods used here.

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[2]G. G. Himmler and F. R. Nissel, *Plastics Technology*, 3 (4), 280-282, 1957.
[3]D. P. Dodgson and M. Pike, *Svenska Plastforeningens Plasttenik*, 1960, Section TIF 2.

Part 3 of 'Stabilizers for pvc,' which will appear next week, will deal with stabilizers of Groups I and II. (For classification see Part I of this series, RPW, July 1, 8).

Epoxy Encapsulated Resistors

FULLY AUTOMATED PRODUCTION LINE IN OPERATION

A PRODUCTION unit for the automatic manufacture of electronic components that combines statistical quality control with fully mechanized processing — all under the guidance of a digital computer — was given its first public demonstration recently at the North Carolina works of the Western Electric Co. in USA.

This manufactures deposited carbon resistors that must meet severe electrical requirements, yet operate for many years without failure. The resistors are used in large quantities and in a variety of electronic equipment including radar and missile control systems.

In addition to controlling step-by-step details of manufacture, the computer can accept a production schedule for a full month's output and automatically issue detailed instructions to the fabricating machines to make and package any or all of four basic power sizes of resistors in such quantities and resistance values as may be desired.

New Development

According to engineers who developed the automated line, it is the first time that a computer has been used in conjunction with a statistical quality control system to control a series of fabricating machines which produce precise, electronic components.

The resistors consist of a short ceramic rod or core which is first coated with carbon. A conductive gold coating is applied to each end of the core for attaching a cap and wire terminal. Then a spiral groove is cut into the carbon film to change the electrical path on the core and raise the resistance to the desired level. Finally, the resistor is encased in epoxy resin.

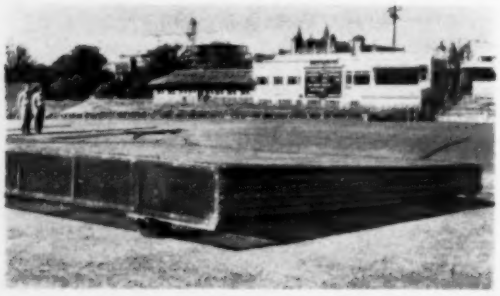
A precured epoxy shell is fitted over the core, and two partially cured epoxy pellets are inserted over each lead. The resistor then moves through an oven for approximately 15 min. at a temperature of around 150°C. The shell, fully cured, does not melt, and rests on the gold caps of the resistor, retaining an air space along the resistor body to prevent organic contamination of the carbon film. The partially cured pellets on the leads soften, forming an effective seal with the shell.

Accuracy Essential

In missile systems, deposited carbon resistors are required in very large quantities and they must work under extreme conditions of cold, heat, humidity, vibration and shock. In certain defence equipment, a failure rate of no more than one per 200m. hours (some 23,000 years) of operation is permissible.

It was mainly this reliability requirement which necessitated the design and development of the automatic production process. Previously individual, precision products had been made by manual or semi-automatic processes open to contamination from handling and the shortcomings of human control.

By adopting advanced automation, contamination disappears as a problem, production is vastly increased and a level of reliability is attained that manual methods cannot match.



Wicket covers at the Sussex County Ground at Hove utilize polyester glass sheet — which is normally sold as roofing sheet — manufactured by Rubber Improvement Ltd.

Polyester/Glass Fibre Belt Guards

Sharples Centrifuges Ltd. is using polyester/glass fibre for centrifuge belt guards.

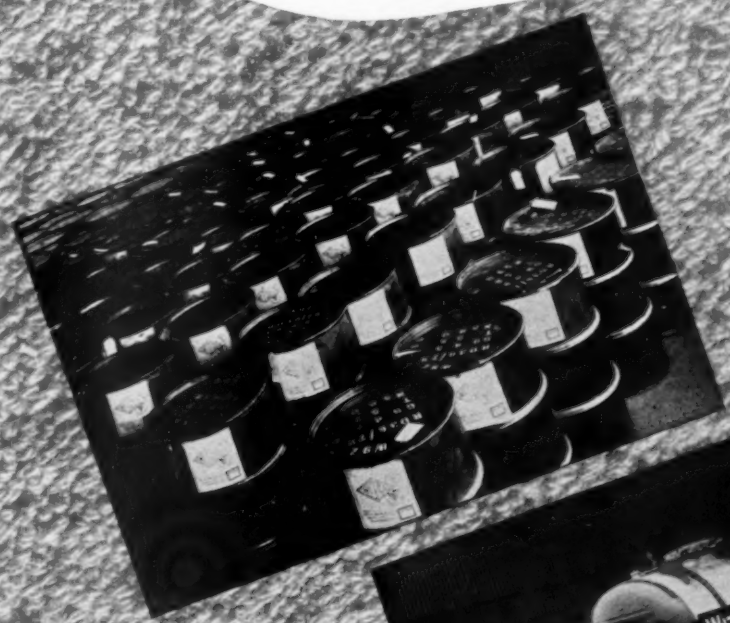
The guards, moulded by Osma Plastics Ltd., completely enclose the belt-running system of the centrifuge and serve the dual purpose of protecting the operator from injury when the machine is running and protecting the belt and machinery from damage.

The Sharples 'Super Centrifuge' runs at between 15,000 and 16,000 revolutions per min. and is employed for such applications as the purification of heavy fuel oils for marine and land installations and in the manufacture of paints and varnishes.

Polyester/glass was chosen because the belt guard has to withstand exceptional vibration, yet retain its strength and appearance. In addition, it is cheaper than metal in this application.

WITCO

LATEX
BACKING
COMPOUNDS



FLOWING TO SERVE ALL THAT IS
BEST IN THE RUBBER INDUSTRY

Keeping the Air Clean

POLLUTION PROBLEMS IN A RUBBER FACTORY

By PETER W. SHERWOOD

This article outlines methods adopted in the USA to identify the sources of smells and air pollution in the rubber industry. Methods of reducing objectionable odours are discussed

IN a recent survey of major industrial cities in the United States, 27% of the chief public officials concerned with control of air pollution identified the rubber industry as a major source of objectionable odours.

In locations where rubber manufacturing plants are, in fact, the source of bad odours, emitted to the atmosphere, this situation creates a serious problem which can cause poor relations with the surrounding community and which eventually leads to restrictive legislation and ordinances. Progressive management in the rubber industry is therefore taking active steps toward eliminating the nuisance of odour emission.

There are several methods now available for elimination of industrial odours including, above all, removal at the source, combusion of odorant compounds, removal by absorption or adsorption from the waste gases, and masking or counteracting by addition of suitable reodorizing agents. By suitable selection of these methods, the rubber manufacturer can avoid a great many complaints and much risk of poor community relations.

Air Survey

However, before any odour removal programme is started, management must assure itself whether neighbours' complaints against its plant are justified and it must establish a base for determining the effectiveness of any subsequent remedial action. Thus, the first step in combating an industrial odour problem is to carry out an air survey in the area surrounding the plant.

The main sources of objectionable odours emanating from rubber factories are generally identified as phenolics, sulphur compounds aldehydes, and solvents. Beyond that, there is a complex mixture of other odorants, present in very low concentration, but still offensive to the sense of smell.

With such a complexity of sources, an area survey of odour occurrence and distribution can draw on gas sampling and chemical analysis only as auxiliary tools and the only reliable measuring tool is the human nose.

After enough data has been accumulated for a statistical evaluation of the overall survey, it is possible to draw a map of normal odour distribution for the plant-surrounding area and, with it, a basis is given to attack the overall problem.

Personnel assigned to making a survey around an industrial plant are best drawn from the outside since people who have long been exposed to a particular smell sensation become inured to it.

Curing the Problem

In most instances, odours emitted by rubber factories are not physiologically harmful. Instead, their nuisance value is generally psychological and involves relations between the manufacturing plant and its surrounding community. As such, the problem is dealt with as part of the broader picture of air pollution control with all of its implications of public relations and local restrictions.

This aspect is particularly important to the rubber industry in the light of much evidence that public interest in the industrial odour problem is definitely on the increase. Despite the many contributors to odour, especially in municipal areas, a large segment of the public tends to single out rubber factories as major offenders.

Some rubber-producing and compounding operations lend themselves to elimination of odour at the source. However, here each problem is a specific one and cannot be considered in a general discussion.

Elimination by Conversion

In other cases, it is possible to eliminate, or at least to reduce the extent of objectionable smells by converting the responsible compounds to a more innocuous form. Such conversion is effected by chemical conversion (oxidation, neutralization, hydrolysis, polymerization, etc.). This approach is rarely feasible, however, in the case of the complex mixtures which abound in rubber processing and which, in many cases, defy chemical analysis.

Dispersion into the atmosphere may be adequate if meteorologic and aerodynamic conditions surrounding the plant site are favourable. Where a problem exists in this respect, improvement is possible in many cases by raising the stack height or the temperature and flow of the issuing waste gas.

Such atmospheric dispersion of smells by use of high stacks frequently reduces the problem but rarely solves it completely. The main limitation is the dependence of such methods on the highly variable direction and magnitude of air flow.

Objectionable smells are conveyed to the atmosphere on solid and liquid particles, as well as in gaseous form. Particulate components may be removed from the plant's effluent gases by filters, cyclones, electrostatic precipitators, etc., all of which are well-established tools in air-cleaning technique.

A different approach must be taken for the removal of odours which emanate in gaseous form, and it is found that the majority of industrial odour problems are in this category.

Where a serious problem persists, industrially practicable methods of control may take any of the following four main forms: catalytic combustion of the odorous compound, removal by absorption or adsorption, and masking or counteracting of the smell by means of reodorants.

Catalytic Combustion

Combustion is feasible for destroying many types of odour-causing organic materials as well as hydrogen sulphide. To be effective, as a method of control, the oxidation must be complete and its reaction products must be innocuous (*i.e.* carbon dioxide, water, nitrogen, and sulphur dioxide which, though irritating is much less objectionable than are many other sulphur compounds). Incomplete combustion may be worse than none at all for it superimposes irritating oxidation products, such as sulphur dioxide and nitrogen oxides on top of the remaining odour problem.

To achieve the required completeness of oxidation without recourse to very high temperatures, catalytic converters are employed. Here, the industrial waste is mixed with air and passed over a catalyst consisting of platinum or a platinum alloy on a porous carrier such as activated

alumina. Operation of the unit is in the range of 650-1,250°F.

Key to the economic operation of a catalytic oxidation unit is the amount of combustible gas which is present in the waste stream. With a combustibles content of 15-20% of its lower explosive limit, it is usually possible to run the combustion unit without external fuel except during start-up. At 5% of the lower explosive limit, or below this point, such a high firing temperature is usually called for that this type of operation is no longer economical. On the other hand, very high concentrations of combustible components in the waste gas will result in the evolution of sufficient heat in the course of oxidation to permit recovery of waste heat which sometimes pays for the operation of the odour-removing combustion step.

As pointed out above, catalytic oxidation is not always the answer to odour removal and, even where use of this method is indicated, it must be checked by pilot plant operation to ensure reliability (*i.e.* completeness) of deodorization, and to establish the operating problems and costs.

Absorption and Adsorption

A second commonly employed method for odour removal involves absorption. This is a possible approach whenever the odorant component can be dissolved or emulsified in a low-cost liquid. Here, any one of a number of commercially common types of scrubbing equipment may be used. However, use of absorptive methods frequently introduces a problem in river pollution by the absorber's liquid effluent stream.

Absorption on activated charcoal is frequently an effective answer to odour problems. The method is highly effective for the removal of a wide range of odorous components. However, the economic range for absorptive deodorization is limited to an initial odorant concentration between 2 and 5 ppm. This compares with a normal practical operating range between 1,000 and 1,500 ppm in catalytic oxidation methods.

As an extension of adsorptive deodorization, Rhodia, Inc. has recently developed a method for treating activated charcoal beds with deodorant agents which add to the effectiveness of odour control.

Odour Masking and Counteracting

Considerable progress has been made in recent years in odour masking. In this scheme, a masking agent with an acceptable but stronger odour than the offending compound is injected into the waste gas stream. The effect of such treatment is to render the plant's emitted smell less objectionable, literally by overpowering it, and without actually eliminating it. Typical examples of such agents are o-chlorophenol, pine oil, and camphor.

A main advantage of masking methods is that they call for only minor capital expenditure (use of automatic proportioning pumps in this service is on the increase). The chief cost is the continuing expense for the masking agent. Selection of the agent most suitable for a particular application is highly complex. Several organizations are specialized in the business of formulating and manufacturing such materials and most rubber processors leave this task to the care of the professional.

Once a suitable masking compound has been selected, and the best place for its introduction into the industrial waste system has been determined, it is still necessary to study its effectiveness, especially during the initial stages of its use by making a survey in the area surrounding the plant in much the manner described above for the initial investigation of the problem.

By contrast, 'odour counteraction' employs pairs of odours which are antagonistic to each other and tend to neutralize each other when smelled simultaneously. This approach is used especially in combating multiple and complex sources. The counteractant (*e.g.* chlorophyll) is introduced into the main air movement, from the plant, usually at some point near the top of the discharge stack. By the time the air movement reaches the surrounding area, the counteractant is well mixed with the objectionable odour. Once again, the selection of counteractant to solve a particular problem must be left to the profession. Suppliers of masking agents are usually also in a position to service rubber industry's needs in regard to counteractants.

Cutting Container Costs by 60%

NEW blow-moulding machines which claim to cut the cost of fabricating hollow plastics bodies of up to 8 cu. ft. volume by as much as 60% are now being made by Emerson Walker Ltd. of Gateshead, Co. Durham. A small machine was operated for the first time at the recent Interplas exhibition in London.

Recently Emerson signed an agreement with Martin Rudolph of Velbert, West Germany, to manufacture the full range of Rudolph machines. The first result of this collaboration is the range of nine Emerson-Rudolph Blow Moulders which can produce blown plastics items ranging in size from 61 cu. in. to 8 cu. ft. volume.

Large capacity is said to be one of the revolutionary features of these machines. This has been attained by the use of a storage head with hydraulic ram; thus the plastics tube can be extruded very rapidly. In addition, the mould can be lowered, by hydraulic lift, away from the extruder head to give variable mould length.

Singe blow mouldings of up to 44lb. weight can be obtained with the large BA-200 machine. The BA-60 can cope with moulds requiring up to 22lb. of plastics and the BA-100 can take up to 33lb.

Copolymer Drawback

The Board of Trade is considering an application for the allowance of drawback of duty on copolymers of vinyl chloride and vinylidene chloride in the form of powder, when used for the UK production of curled dolls' hair for export.

Representations by interested parties can be made to the Board of Trade up to July 21.

Spraying a cow hide side with colour bound with I.C.I.'s Butakon latex ML590 at the works of a London tanner

Silicates Research Centre

REINFORCING FILLERS FOR POLYMERS

A NEW centre for research and development of industrial silicates by Joseph Crosfield and Sons Ltd., was opened at Warrington recently by Professor Fred Fairbrother, DSc, FRIC, Dean of the Faculty of Science, University of Manchester.

The main laboratory of Crosfield's new technical centre at Warrington, showing administration offices at the far end. Each bay of the laboratory is engaged on control analysis in one field

Professor Fairbrother said that he was very pleased and honoured at being asked to perform the opening ceremony. He owed a debt of gratitude to the Unilever Group, of which Crosfields is a part, as he was awarded a Leverhulme research fellowship to carry out research in California some years ago.

The fundamental research being done in industrial laboratories such as this, said Professor Fairbrother, had increased very considerably since the war. Many of the most important developments in the last 100 years had been the result of the economic urge.

He had, he said, paid a visit to the technical unit and had been very impressed with what he had seen. In fact he thought the laboratories had 'all mod cons' and he would be very happy to work in them himself or to see his research students working there.

The new building represents the second stage of a £5m. project for the development of the Warrington works. The first stage was completed in 1959 when the chemicals building, which cost about £1,175,000, commenced production. The second stage of the programme was a logical development in bringing together the research, works control and technical service laboratories in a new building, which also houses the technical department and pilot plant facilities. The cost of this building, built on the site of an old wharf warehouse, was nearly £700,000.

Two of the products in the range manufactured by Crosfields — aluminium and calcium silicates — have been developed to meet the need for a reinforcing filler in natural and synthetic rubbers and other resins which will allow free colour compounding without sacrificing physical properties. Both of these materials are produced in a range of millimicron sizes in the form of white powders, the hydration of which has been strictly controlled to develop the full reinforcing structure characteristics of the hydrate structure without the excessive liberation of moisture or steam during curing. The development of more advanced reinforcing materials for rubber and plastics is one of the subjects now receiving particular attention in the laboratories.

RAPRA Information

The most recent information circulars issued by the Rubber and Plastics Research Association are Nos. 457, 458 and 459. These list trade marks, chemical nature where known and suppliers of organic chemicals offered to the rubber industry. 457 deals with activators of vulcanization, 458 with retarders of vulcanization and 459 with odorants deodorants and reodorants. These circulars, as part of the information service given by RAPRA, are sent to all members of the association and are brought up-to-date every year.

BFP in Step

THE British Plastics Federation has kept in step with the increasing production of plastics materials, which have shown a twenty-fold increase since 1938, and last year amounted to more than 560,000 tons.

This is stated in a new booklet published by the Federation called 'Aims and Objects'. The structure of the organization is described: eight groups cover raw material supplies, material manufacture, moulding, fabricating, laminated and fibrous products, packaging, reinforced plastics and engineering. Four of the groups have sections, the material manufacturers, for instance, covering moulding materials, synthetic resins, sheet, pvc compounders, surface coating resins, and calendered pvc sheeting. The fabricators have five sections and three sub-sections.

More than 40 technical committees are continuously at work, says the booklet, and it is not unusual for 250 group or section meetings to be held in a year.

Information services include a monthly bulletin, a service of abstracts from journals all over the world — believed to be unique — including the supply of microfilm or photostat copies of articles, a library and a general information bureau.

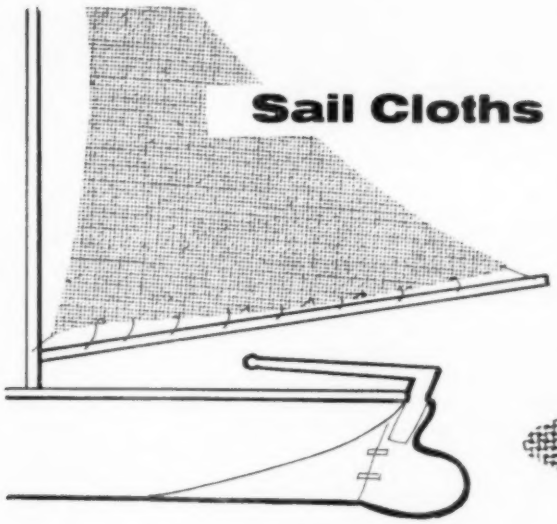
A New Container for SBR

Shell Chemical Co. Ltd. is now supplying its 'Cariflex' styrene-butadiene rubbers in a free, non-returnable 'Flotainer' package.

This package — capacity half-a-ton — has stacking advantages over loose bales and contains the rubber against the tendency to cold flow.

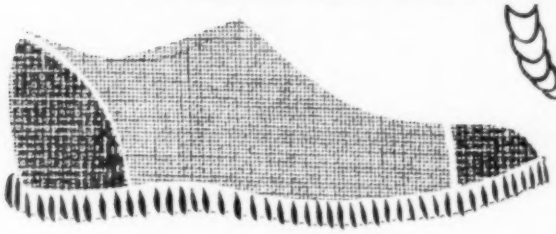
The 'Flotainer' is a crate of strong timber battens mounted on a wooden pallet, with an internal lining of hardboard to give a smooth inner surface. The four sides are fully collapsible, but when erected are secured and strengthened by steel strappings. A weatherproof sheet covers the top of the bales. It holds 15 bales of rubber and external measurements are 45¼in. x 31½in. x 40½in. high.

One container can be stacked upon another up to a maximum of five.



Sail Cloths

Protective Clothing



Boot & Shoe Materials

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VIEWS and REVIEWS

Non-woven Fabrics

THE idea and possibilities of making fabrics without weaving them, by taking the fibres and sticking them together is an attractive prospect with much scope for development. Two recent articles on the subject are interesting. Both are in German; one in the Austrian *Praktische Chemie* discusses binding agents, and the other, in *Der Plastverarbeiter*, deals with the processing machinery.

Under the title, 'Non-woven Textiles from Papermaking Machinery', in *Der Plastverarbeiter* for May 1961, Vol. 12, No. 5, pp. 212-3, E. O. Grenzsch gives first a general picture of the production of non-woven fabrics and then provides the evidence for his sentence: 'In the near future, the papermaking industry will be taking up the production of textiles in direct competition with conventional woven materials and with plastics films'. He expects paper machines with speeds up to 400 metres per min. to revolutionize the manufacture of these non-woven fabrics and to make serious inroads into the textile field.

He claims that the present situation results from the convergence of three lines of development: (a) the spinning and weaving industry has been looking for a means of utilizing their scrap natural and synthetic fibres, (b) the plastics industry has been trying to reinforce plastics sheets with fibres, and (c) the cellulose and paper industry has been seeking to give greater strength to some of its products by adding plastics.

'These three industrial groups are all marching in this direction independently of each other and even without knowledge of the related developments in the other camps, to make the same product, namely a synthetic fabric'.

Classifying The Structures

Three types of structure of such fabrics can be distinguished: parallel fibres, crossed fibres, and random, felted fibres, all needing a binding agent. In the first, the fibres are combed parallel and then treated with the binding agent and any desired finish. The product is, of course, only longitudinally strong. The felted material is the strongest of the three but requires the most expensive fibres and binders.

The anticipated growth of commercial production of non-woven fabrics arises from developments in two fields: binding agents and machinery. P. W. Sherwood, writing in *Praktische Chemie*, the journal of the Austrian chemical industry, for October 1960, Vol. 11, No. 10, pp. 421-3, deals with the polymeric binding agents, which range from the cheap solutions of casein or alginate to the expensive dispersions of acrylates and butadiene-acrylonitrile. The proportions of binding agent vary widely, from 10 to 70%, an average figure being perhaps 30%.

The use of water-soluble binders is declining, being used now only in those lines where cheapness is the main or only consideration. Water dispersions, such as pvc, acrylates, polychloroprene, butadiene-styrene, butadiene-acrylonitrile, and sometimes small quantities of thermohardening resins, have the advantages of being easy to apply, being readily taken up by the fibres, and of not being so dangerous as many organic solvents.

Dry Binders

Although liquid binders are still the most widely used, two forms of 'dry' binding are employed: using powders or fibres which are melted by heating.

In powder-binding, the resin (which may be a thermoplastic such as a polyvinyl or polyacrylate, or a thermoset like phenolcondensates) is distributed in finely-powdered form throughout the fleece of fibres. Heating melts and further distributes the resin.

The advantages of powder-binding are cheapness, ease of application, efficiency of distribution, and, of course, use where moisture must be avoided (*e.g.* in most forms of quilting).

Of growing commercial importance and technological significance, says Mr Sherwood, is the use of binding-fibres worked into the fleece, then passed through heated rolls or over heated drums specially made of a silicone or ptfe to avoid sticking. Thermoplastic binding-fibres are of the greatest interest, particularly a softened cellulose acetate, and a special low MP terylene. Its chief disadvantage is its relatively high cost.

'Theoretically, it should be possible to use any binding agent whose softening point is below that of the fibres being bonded. In practice, there must be a big difference'.

Discoloration and Chemical Resistance

Melamine formaldehydes and related thermosetting resins are the most commonly-used dry binders, being of outstanding interest for the production of crease-resistant fabrics, although a certain degree of stiffening may be a disadvantage, and there is some danger of discoloration and lowered resistance to some chemicals, though both of these are at a minimum with the cyclic urea derivatives, the epoxides, and triazones.

Sherwood then summarizes some of his own work on the properties of non-woven fabrics using a variety of binders, and also the somewhat similar work of J. T. Taylor. He concludes: 'The ideal binding-means for non-woven fabrics has not yet been found. The chief properties must be: strength, ease of application, strong adhesion to the fibres, elasticity, and — depending on its ultimate use — good resistance to light, washing, and dry cleaning'.

Special requirements, such as crease-resistance, softness, heat resistance, may need taking into account. There is also the cost. 'The future demand for non-woven fabrics is for the main part to be sought in the laboratories of the makers of the binding-agents'.

Enter the Papermakers

Herr Genzsch, in *Der Plastverarbeiter* puts his emphasis on machines. Up to now, conventional textile machines have been used, such as carding machines, or plastics film calenders. Production speeds have, therefore, been low — in no case, he says, more than 12 metres per min.

But into the non-woven fabric field has now come the

COMMENT ON SCIENTIFIC AND INDUSTRIAL MATTERS

by **F. C. JENNINGS**

papermaker, with his long and wide experience in converting masses of fibres into sheets of what are really felted, non-woven fabrics. Papermaking machinery works very quickly; in USA working speeds of 200 metres a min. are fairly common and this may soon be raised to over 300 metres per min.

With such machines, and using polymer latices, a fully-automatic, completely-integrated confectioning system can be envisaged which begins with the raw materials, the mixture of fibres, and proceeds through felting, impregnating, colouring, printing, embossing, surface-texturing, to the final cutting to length or shape.

Several large American papermaking firms are already well-advanced in their plans to launch into the world's markets cloths and garments made from non-woven fabrics.

Tyre Standardization

I think it was L. J. Lambourn in his IRI Foundation Lecture for 1958 on 'The Indispensable Pneumatic Tyre: Past, Present and Future', who first pointed out the progressive change which has taken place in the height/width ratio of car tyres. In the 30 years or so before the date of this lecture, the ratio had fallen from over 1.10 to below 0.90, and he prophesied that it would fall further, perhaps by 1965 to about 0.80.

I see from *Die Gummi Bereifung* for May 1961 that this 'fattening of tyres has indeed continued and the lowest figure is now 0.83. This appears in what is, so far, the most detailed report to appear in the trade and technical press of the Vienna Conference (the 5th European) on Tyre and Rim Standardization held in April 1961.

This is not the place to repeat the figures agreed upon or even to comment upon them. They are given in full in *Die Gummi Bereifung*. The height/width ratio is used there to classify car tyres into three groups: 'Super Balloon Tyres', ratio 0.95, 'Low Section Tyres', ratio 0.88, and 'Millimetre Tyres', ratio 0.83.

Disagreement Over Load Calculation

The conference had to meet a difficulty which seems to be inherent in most international negotiations — disagreement over the meaning and definition of apparently simple terms. In this case the disagreement was over the method of calculating the load on the tyres of vehicles. There seemed to be a difference between the USA and the UK on the one hand and France, Italy, Benelux, Scandinavia, and Germany on the other. It turned on the number of passengers and the luggage allowable for them. A sub-committee was appointed to try to harmonize the views, even if that means incorporating a national load-factor depending on the official licensing regulations.

The conference came to agreements on tyres and rims for scooters and motor cycles, and took steps to develop further the European standards for the tyres and rims of trucks and buses. A sub-committee is soon to be formed to deal with the standardization of commerical vehicle tyres of radial construction.

This valuable work of international standardization by means of regular European conferences is strengthened by the presence of an American observer and by his participation in the discussions. It is possible that there may sometime be formed a permanent European Association of tyre and rim manufacturers which will deal with questions of standardization. When this happens, the hard work of L. J. Lambourn, his British colleagues, and their European collaborators, will have come to fruition.

Shake, Thump and Rumble

It was an excellent idea of the Society of Automotive Engineers in Detroit to assemble half-a-dozen of the leading tyre technologists from the English-speaking world to discuss tyre 'roughness', but whether it worked out so well in practice I can judge only from the summary given in the *Rubber Age* for May 1961, Vol. 89, No. 2, pp. 308 and 310.

It looks to me as if what is wanted now is a single, expert co-ordinator and editor who will eliminate the repetitions, put the mass of information and data into a consecutively logical form, and draw such conclusions as the present state of knowledge permits.

It would seem to be agreed that kinds and degrees of undesirable vibrations (with names enclosed in quotes like 'shake', 'roughness', 'thump', and 'rumble') occur when some kinds of vehicles are driven along some kinds of roads and these roughnesses are caused and/or propagated by the tyres. The technologists seem able to measure these unwanted vibrations in one way and another, to find that they lie in the region of 20 to 100 cps, and to relate them to distinguishable harmonics up to the tenth order.

I would have liked to know more about the Dunlop machine described by V. E. Gough, which is fully automatic and has been in regular use for inspecting production tyres for about two years. But whatever method is used, the tyre technologists agreed that non-uniformity in tyre construction was a basic factor in generating the disturbances under discussion.

It was a natural step therefore to suggest that the way to eliminate the trouble is to eliminate the non-uniformity. The idea in fact was suggested by several of the speakers; only one seemed to have his doubts.

Near-perfection is Uneconomic

I confess it sounded to me something like the 'wonderful one-hoss shay' of Oliver Wendell Holmes which 'ran a hundred years to a day' because it had no weak spot, it was entirely uniform, every part was as strong as every other part, so that nothing broke first but it all disintegrated at the same moment.

But, to quote the words of the summary in the *Rubber Age*: 'The solution of the problem due to non-uniformity will not be one of near-perfection in both tires and wheels, as this may well be uneconomic on an extended production basis. Studies will have to include the economics of the use of tires of appropriate non-uniformity and wheels of appropriate eccentricity and means of selectively fitting these'.

CHARLES JENNINGS

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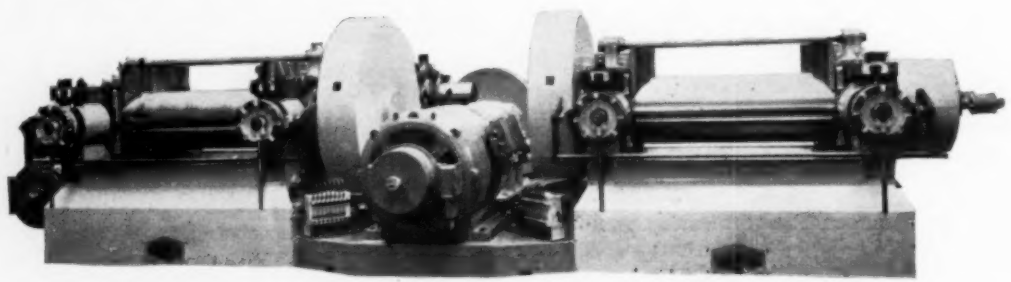

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MEN *and* MATTERS

A Review of People and Events

by Peter Richards

IN 1802 Eleuthere Irenée du Pont de Nemours, a student of the famous French chemist Lavoisier, built a small mill on the banks of Brandywine Creek in Delaware, America, for the manufacture of gunpowder. This was the beginning of the giant Du Pont company which today has 77 plants in USA, employing 88,000 people, as well as facilities in eight other countries, with more being built in three others.

The latest result of that small seed that was planted at Brandywine Creek is the isocyanate plant to be built at Maydown, Northern Ireland. (See page 40.) This new plant is preparing for the big expansion in sales that can be expected in urethane polymers. So it is appropriate that, at the same time as Du Pont announced its new Maydown project, Sam McCune, the popular deputy managing director of Du Pont (UK) also announced that James L. Trexel had been made isocyanates sales manager.

'In order to sell and service our Hylene organic isocyanates most effectively, we are establishing these products as a separate product line in the sales department', Mr McCune told me.

Mr Trexel, 38, was born in Pennsylvania. He came to London in 1959 as domestic sales manager (elastomers) of Du Pont (UK).

Distillers Plastics Appointments

A number of new appointments have been made by the Distillers Plastics Group: H. H. Woolveridge (chairman of the group) becomes chairman of British Geon Ltd. and of Distrene Ltd. P. A. Delafield becomes deputy chairman of the group and deputy chairman of British Resin Products Ltd.

E. J. Westnedge has been appointed managing director of the group; managing director of British Resin Products Ltd., and a director of British Geon Ltd. and Distrene Ltd.

J. D. Winston has been made sales director of the group and a director of British Resin Products Ltd., while P. C. E. Kirby becomes export director of the group, and a director of British Resin Products Ltd.

Air Dunlop

They are certainly going up in the air at Fort Dunlop. The first private heliport in the Midlands was inaugurated on Monday June 26, when a Westland Whirlwind helicopter took D. B. Collett, an executive director of the Dunlop Rubber Co. Ltd., from Battersea Heliport to Fort Dunlop, Birmingham.

At this stage I am told that the company is not thinking of operating a regular scheduled helicopter service between Fort Dunlop — where the heliport has just been completed — and other Dunlop factories in the UK. But directors and VIP visitors will take to the air as much as possible.

It now seems that my comments on the new Dunlop symbol (which is a 'D' enclosed in an arrowhead, and which I took to be a prelude to Dunlop going into the airline business) were justified.

Polyester Goes to Church

An advertisement in the personal columns of a London evening newspaper which said: 'Would anybody make a glass fibre spire?' caused Brylan Plastics to embark upon an unusual piece of plastics engineering.

The spire was required for the new St. Andrew's Church, Dartford. The architect, who had chosen a traditional style for the main building, specified a modern plastics material for the spire — and for good reasons.

At 5cwt., the 33ft. spire is considerably lighter than similar structures built in conventional materials. This meant that useful economies could be made in the construction of the tower supporting the spire. And, because the spire could be prefabricated, normal building work on the church was able to proceed without interruption.

R. F. G. Lea, deputy chairman and joint managing director of CIBA (ARL) Ltd., Duxford, Cambridge, has been appointed a director of CIBA Clayton Ltd., Manchester

The spire was moulded in halves from Bakelite polyester resin reinforced with chopped strand glass fibre mat. The skirt was made in one piece from the same material, and shaped aluminium formers were used to reinforce the join at the base of the spire.

It is intended to illuminate the complete steeple at night with internal floodlighting — a dramatic illustration of another advantage of glass fibre over conventional materials.

Brylan Plastics used a Bakelite polyester for the GRP spire of St. Andrew's Presbyterian Church, Dartford. Here the prefabricated spire is being lowered by crane on to the supporting tower *(See: Polyester Goes to Church)*

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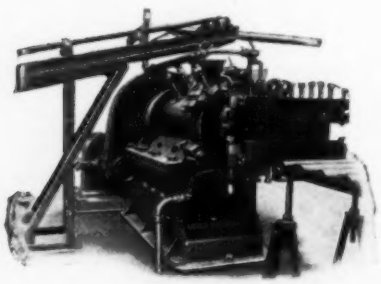

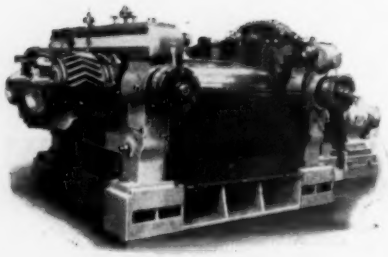

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A Different Kind of Model

Although great interest has been aroused by the Russian fashion models at the Soviet Exhibition, which opened at Earls Court, London, yesterday (July 7), a model that should have more appeal for rubber and plastics people is featured at the show.

It is a model of the Sumgait plant at Azerbaijan, which manufactures SBR. Tyres manufactured from a diene blend are also on show.

Underlay for Architects

Architects from all over the world found that they were walking over rubber carpet underlay when they met for the Sixth Congress of the International Union of Architects in London this week (July 3-7).

Because of its good insulation properties and the ease with which it can be laid without seaming, a Vitafoam rubber underlay was chosen to go under the only carpet in the specially-built congress headquarters on the South Bank.

Sore Thumbs

In buildings such as churches, pipes and cables in exposed positions stick out like sore thumbs. So it is hardly surprising that cables with a pvc oversheath coloured to match the background, is becoming more and more popular.

One beautiful West Country church, for example, has been rewired with over a mile of pvc sheathed cable supplied by British Insulated Calender's Cables Ltd.

The electrical installation in this church — the Parish Church of St. Mary Magdalene, Taunton — includes 88 points controlled by 49 switches, a carillon motor outlet and an organ blower motor outlet. The cables fitted blend with the masonry of the church which is said to be one of the finest examples of the perpendicular style in England.

Appointments in Brief

Three appointments have been made to the board of directors of Midland Silicones Ltd. A. K. Simcox, general sales manager, becomes sales director. J. S. Hughes, manager of the process and product development department, becomes development director. The third newcomer to the board is H. N. Fenn, a director of Dow Corning Silicones Ltd., USA, with which Midland Silicones is closely associated.

* * *

Bernard Wardle (Eveflex) Ltd., pvc-coated fabrics manufacturers at Caernarvon, North Wales, has appointed two new directors: W. Howson, chief engineer, and J. W. Sutherland. Mr Sutherland will be responsible for new developments and production.

* * *

Dr K. O. Lee has been appointed a director of the Lee-Healey Co. Ltd., Leicester. He is the son of the chairman and has been associated with the company for a number of years as technical adviser.

As the first phase in a new safety campaign North British Rubber Co. offered awards for safety slogans. Here, E. A. Martin, works director, congratulates solvent operator N. Forsyth whose slogan — Safety: *S*pells *A*ccident-*F*ree *E*mployment *T*o *Y*ou — won him £10

P. L. Reed has joined the public relations department of British Insulated Callender's Cables Ltd. Mr Reed was formerly public relations officer of the Telegraph Construction and Maintenance Co. Ltd. (now a member of the BICC Group) and Submarine Cables Ltd. (owned jointly by AEI and BICC).

* * *

Fablon Ltd. has appointed B. J. Piggin as product manager for Fablonite, the melamine laminate.

Polly Ester Says...

'Bead wire — Well, that's what he said: the pearls will come later'

THE LEGAL ANGLE

Law on Youth

By a Barrister

Last week we told you the story of a boy injured through the skylarking of a workmate. We warned that masters are vicariously liable for the negligence of their servants, committed in the course of the employment — even if the person doing the injury was skylarking, contrary to instructions or orders.

'But I have always understood', queried a friend in the industry, 'that an employer is limited in his responsibility for injuries caused by one servant to another. Isn't this so?'

There was an old rule known as the 'doctrine of common employment'. Under this, the master was not responsible for the results of the negligence of one servant, if those results were confined to injury, loss or damage caused to a fellow employee — to someone, that is, in 'common employment' with him.

But this doctrine has been abolished. Although many employers do not seem to realize it, they are just as responsible to fellow servants as to any customer, visitor or other third party, injured through the negligence of a servant.

The law, then, is clear — and well worth remembering. An employer must take reasonable care in all that he himself does, so as to avoid causing injury to others.

But he is not only responsible in law for the unfortunate results of his own negligence, but also for those of his servant. Provided that the damage was caused in the course of the man's employment, the employer has to carry the metaphorical can. And this applies whether the injury is caused to a fellow servant, or to anyone else. The doctrine of common employment is dead — and the sooner that its memory is buried, the sooner a popular and dangerous misconception will disappear.

News from South Africa

Tyre Duty Confirmed

DUNLOP (RHODESIA) STAKE NOW £2.8m.

THE Federal Assembly has confirmed the increased duties imposed by the Government of the Federation of Rhodesia and Nyasaland on certain sizes of imported tyres and tubes as a means of protecting, until further notice, the only tyre producing factory in the Federation, that in Bulawayo of Dunlop (Rhodesia) Ltd. This protection has enabled the company to increase its labour force from 720 to 1,000 and its 1960 expenditure of £800,000 to over £1m. The company has now invested about £2.6m. in the Federation, of which £1.5m. is in buildings and machinery. It has been producing Dunlop and India brand tyres.

Mine Belting

Considerable use is now being made of conveyor belts in the Kimberley diamond mines, replacing the older unweildly pans. Conveyor belts have also been installed in the coal mines, the copper mines and elsewhere, with a marked reduction in the number of men needed. At the Kimberley diamond mines the labour force was cut from 175 to 23. South African industry is also making increasing use of conveyors in place of skip hoists and cable systems. At the Buffelsfontein gold mine a conveyor belt has replaced a skip hoist, with excellent results.

Vizara Plantation

What is believed to be the only rubber plantation in the Federation of Rhodesia and Nyasaland, the Vizara rubber estate near Nkata Bay in the Northern Province of Nyasaland was first planted in 1906. The estate now has over 75,000 trees and is reported to be producing some 300lb. of rubber an acre a year. After initial processing, grading and packing, the rubber is exported to Southern Rhodesia.

One Shot Process in Durban

An entire polyether foam plastics manufacturing plant has been designed by the technical staff of Felt and Textiles S.A. Ltd., and erected at the plant in Jacobs, Durban, in less than two months. This plant embodies a one shot manufacturing system, in which raw chemicals and catalysts are mixed simultaneously and the liquid projected on to the foaming beds in one action.

Foam Centre

Dunlop-Foam (Pty.) Ltd. has extended the Port Elizabeth factory formerly used by Lintafoam, and is planning to use it as the main South African production centre for foam rubbers, polyether foams, rubberized hair and allied lines. The polyether foam to be added to the manufacturing range will be a new introduction to the items made in South Africa. It is expected to be in big demand for upholstery filling. Some 30,000 sq. ft. has been added to the floor space of the Port Elizabeth factory, which now has an area of 80,000 sq. ft.

Corroded to Paper Thickness

Airflow Fibreglass Contractors, P.O. Box 178, Bergolei, near Johannesburgh, recently contracted with a large oil company to set a glass fibre roof over a seriously corroded steel roof, which was $\frac{3}{16}$in. thick when laid but, in four years, had corroded to paper thickness. This company is also making acid tanks, boats and caravans of glass fibre.

Plastics Institute Dinner

There was a record attendance of 525 people at the Plastics Institute dinner held last week at the Connaught Rooms, London. *Top*—**Lady and Sir W. H. McFadzean** (*left*) **being greeted by H. F. Wilson (PI president) and Mrs Wilson.** *Centre*—**Lady Slater and Sir William Slater (president of the Royal Institute of Chemistry) with Sir Harry Melville (secretary of DSIR).** *Left*—**The president-designate of the PI, Sir Laurence Merriam, proposing the toast to the guests**

Plastics Statistics

MAY EXPORTS AND IMPORTS

PLASTICS materials exports in May 1961 were almost the same in tonnage as for the same month last year: 15,920 compared with 15,917. But there was a considerable drop in value: £3,462,755 compared with £4,236,041. The April 1961 figure was 16,859 tons (£3,615,984). This position is revealed in the official Trade and Navigation accounts, which show that the biggest quantity was taken by Hong Kong (1,390 tons), followed by the Soviet Union (1,254), Finland (851) and Netherlands (860).

Imports were again substantially lower: 7,226 tons (£2,509,397), compared with 9,052 tons (£2,805,709) in May 1960. USA was the main supplier with 2,959 tons, followed by West Germany with 1,598 tons. Imports for the first five months of this year stood at 32,113 tons (£11,343,281) compared with 38,940 (£12,405,901) at the end of the comparative 1960 period.

Exports for the first five months of 1961 amounted to 83,101 tons (£18,607,112), compared with 76,229 tons (£19,598,292).

Details of imports of plastics materials during May 1961:

	Tons	£
Acrylics	316	97,858
Alkyd solid and liquid resins, solutions, emulsions and dispersions	395	77,049
Cellulose plastics:		
Acetate butyrate	182	162,892
Photographic (including cinematograph) film base (except acetate butyrate)	231	295,404
All other	82	75,923
Polyamides	280	196,483
Polystyrene	251	106,587
Polyvinyl chloride:		
Polymers and copolymers	2,673	352,617
All other	679	260,120
All other	2,137	884,464
Total	7,226	2,509,397

Exports of plastics materials during May 1961:

	Tons	£
Acrylic sheet, rod, tube, film, foil and profile shapes in primary form	659	375,310
Alkyd solid and liquid resins, solutions, emulsions and dispersions	680	138,604
Aminoplastics:		
Solid and liquid resins, including solutions	558	79,137
Moulding and extrusion compounds	735	138,503
Cellulose plastics:		
Moulding and extrusion compounds	223	72,534
Sheet, rod, tube, film (excluding regenerated cellulose), foil and profile shapes in primary form	137	89,867
Phenolics and cresylics:		
Solid and liquid resins (straight and modified)	859	114,905
Other	654	204,589
Polystyrene	1,135	204,176
Polythene (polyethylene) sheet, rod, tube, film, foil and profile shapes in primary form	98	36,058
Polyvinyl chloride:		
Polymers and copolymers	834	114,517
Moulding and extrusion compounds	836	168,707
Sheet	696	275,395
Other	59	15,198
All other	6,822	1,326,939
Waste and scrap (including celluloid and film waste and scrap)	935	108,316
Total	15,920	3,462,755

UK exports to countries in the European Economic Community (Common Market) and the European Free Trade Association are shown below.

Exports to Commonwealth countries during the month were 4,385 tons (4,567 in May 1960) and exports to all other foreign countries were 5,945 tons (4,937 tons).

EXPORTS TO EEC

	May 1960	May 1961
Western Germany	1,050	430
Netherlands	653	860
Belgium	426	665
France	826	839
Italy	754	363
	3,709	3,157

EXPORTS TO EFTA

	May 1960	May 1961
Sweden	901	851
Norway	443	440
Denmark	640	388
Switzerland	313	330
Portugal	296	354
Austria	114	71
	2,707	2,434

(Any apparent discrepancies are due to rounding off of figures)

Aid for Road Building

POLYTHENE is becoming an increasingly important factor in the construction of American highways and airport runways, according to a study just completed by US Industrial Chemicals Co. This shows that highway and runway contractors are using more polythene in established construction applications.

Currently the most important use is as a cover during the critical concrete curing period. A recent report by the New York State Department of Public Works stated that 4ml. white opaque polythene sheeting kept concrete slab surface uniformly moist throughout the curing period; handled easily, could be reused repeatedly, and did not detract from concrete compressive strength.

To protect sawed joints in rigid concrete pavements during curing a 2.5in.-wide, .0045ml. polythene tape has been developed, on which are extruded two ribbons of adhesive mastic. Applied on either side of the joint, the tape completely covers it, preventing loss of moisture and infiltration of foreign matter.

Tests claim that these strips are the only effective and economical method of protecting the sawed joints.

Another application of polythene is the use of film, about 1ml. thick, as a moisture barrier under concrete slabs.

Additional quantities of polythene are expected to go into future construction projects in the form of combinations with other materials. One firm, for instance, is extruding polythene over burlap. Evaporation from the burlap, which is wetted before being applied to the concrete, is prevented by the film.

This machine at the Camberley glass fibre plant of the BTR firm Deeglass Fabrics Ltd. is making a special type of mat for reinforced plastics crash helmets. It is claimed to produce high quality mat with a fine degree of uniformity

Rubber Statistics

UNITED KINGDOM — CANADA — MALAYA — JAPAN

IMPORTS of all rubber into the UK during April amounted to 30,550 tons, according to figures issued by the Board of Trade. Exports totalled 5,380 tons. Detailed figures are given below.

Imports	May 1961	May 1960
Nigeria	1,851	1,542
Singapore	5,771	4,671
Federation of Malaya	10,821	9,210
Ceylon	927	394
British North Borneo	373	249
Canada	2,330	1,855
Other Commonwealth and Irish Rep.	598	135
Vietnam	420	155
Indonesia	1,890	488
USA	1,118	4,003
Other foreign countries	4,451	1,819
Total	30,550	24,521
Rubber latex	3,033	3,747
Other raw, including crepe	23,097	13,619
Balata	30	21
Synthetic rubber	3,547	4,988
Others	843	2,146
Total	30,550	24,521

Exports		
Commonwealth and Irish Rep.	1,814	1,391
West Germany	571	305
Spain	632	730
Netherlands	262	370
Other foreign countries	2,101	2,144
Total	5,380	4,940
Synthetic and reclaimed rubber	2,771	2,018
Waste rubber	2,609	2,922
Total	5,380	4,940

Canada

Canadian consumption of all types of rubber in April rose to 8,785 long tons from 8,508 a year earlier, while consumption in the January-April period fell to 33,632 long tons from 39,062 a year ago. April consumption was larger than a year earlier for synthetic rubber and smaller for natural and reclaimed, while January-April totals were below year-earlier levels for all types, reports the Dominion Bureau of Statistics.

April consumption of rubber, by types, was: natural, 2,493 long tons (2,739 a year earlier); synthetic, 4,928 (4,367); and reclaimed, 1,402 (1,364). January-April totals were: natural, 9,849 long tons (13,157 a year ago); synthetic, 18,571 (19,692); and reclaimed, 5,212 (6,213).

Malaya

Shipments of sheet and crepe rubber from Malaya during May totalled 83,675 tons against 82,003 in April.

The May total comprised 10,146 to the UK, 11,814 to USA, 4,732 to West Germany, 8,424 to Japan, 11,811 to USSR, 24,165 to Europe, 5,088 to Commonwealth countries and 7,495 to other countries.

Shipments of latex and revertex in May totalled 8,550 tons against 7,218 in April.

Japan

The Japanese Rubber Manufacturers Association in Tokyo has announced that the production of rubber articles during May amounted to 19,002 tons, compared with 18,855 tons in April.

A breakdown of the tonnage of the main articles produced in May with comparable April figures is as follows:

	May	April
Car tyre tubes	8,833	8,626
Bicycle tyre tubes	675	695
Rubber - soled canvas shoes	1,032	1,052
Rubber shoes	1,224	1,274
Belts	1,099	1,146
Industrial uses	2,729	2,676

Companies in the News

London Rubber

Sales throughout the London Rubber Co.'s group reached a record level for the year ending March 31 1961, the chairman, Elkan M. Jackson, stated at the company's annual general meeting. The net profit at £1,058,500 was also a record, being 26% higher than the previous year. The total dividend has been declared at the equivalent of 37½% on the former capital.

The chairman mentioned the purchase of J. Allen Rubber Co. Ltd., and said that the company was now one of the largest rubber glove manufacturers in the world.

Small losses were made by the German company, London Rubber Co. GmbH, Mr Jackson stated, and the Dutch company, London Rubber Co. (Nederland) NV. The chairman added that every effort was, however, being made to place these operations on a profit earning basis, which 'should not be long delayed'.

Greengate and Irwell

The trading profit of the group for the year ending March 31 1961, before providing for depreciation and taxation, amounted to £357,401, stated the chairman, Jasper Frankenburg, at the company's annual general meeting.

A final dividend on the ordinary stock of 7½% less tax has been declared.

'I still find it necessary', said Mr Frankenburg, 'to warn you of the import of cheap articles from countries where it is not necessary to pay labour the rates maintained in this country or provide the insurances and amenities which our laws force us to give. The Hong Kong footwear trade for instance, in the last year sent in more rubber footwear to this country than was produced in the surviving factories in Great Britain'.

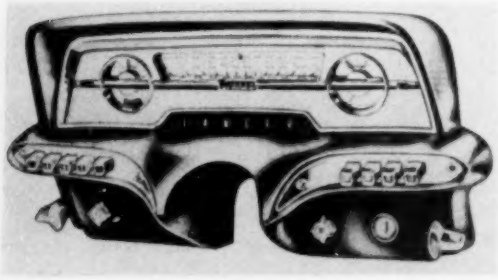
The chairman recorded with great regret the death of William Griffin Morris last year. Mr Morris was with the company from 1901 to 1953, being deputy chairman from 1938 and chairman in 1952.

Silicone Treated Powders

Work carried out by Midland Silicones Ltd. on the treatment of various powdery materials with silicones shows that powders and granular materials can be made less susceptible to moisture. Properly treated dry powders retain their free-flowing characteristics and do not cake on long time storage. Dusting tendencies are reduced and the water-repellency imparted by the treatment is an added benefit to powders used in such products as cosmetic or skin medicants. Materials so far treated include salt, sugar, chalk, pvc powders, talc, zinc stearate and borax.

Perfumed Bags

A perfumed film bag in Fablothene polythene has been introduced by Commercial Plastics. Outlets envisaged are for packaging lingerie, hosiery and knitwear. The film can be clear or slightly tinted, and is available in the normal sizes and thicknesses of the Fablothene range. It can also be printed in up to four colours.



The 1961 American Dodge Lancer features an instrument-panel cluster moulded from Cycolac, acrylonitrile butadiene styrene resin produced by Marbon Chemical Division of Borg-Warner Corporation, whose UK agents are Anchor Chemical Co. Ltd.

Plantation Newsletter

MALAYAN FIRST QUARTER EXPORTS UP

by our Malayan Correspondent

FROM KUALA LUMPUR

ALTHOUGH in some countries the consumption of natural rubber has dropped, Malayan exports this year have remained high. In fact, during the first quarter, Malaya exported 254,618 tons — about 1,500 tons more than the corresponding quarter for last year.

However, there is a realization in the rubber industry here that in future the competition between natural and synthetic will be based on a straight comparison of costs and prices.

There is a new confidence, too, that given a few more years to replant with high yielding, Malaya will be able to meet any synthetic price competition presently foreseeable.

It is for this reason that the Malayan Government has directed its current research efforts at producing cheaper, good quality rubber and is taking all steps to reduce production costs.

The Minister of Finance, Tan Siew Sin, earlier predicted that the average price of natural rubber would remain around the 80 cents a lb. during the first half of the 60's and 60 cents a lb. during the second half. Even at 60 cents, Mr Tan said the Government could operate on a budget based on such prices.

Experts here believe that in the coming years natural rubber will be undercutting the price of synthetic quite seriously. But the big question is whether the producers of synthetic can come up with a completely adequate substitute for natural at good prices.

Only recently when W. G. Wren, head of the chemical division of the Rubber Research Institute returned from USA he announced that natural rubber selling at 75 cents a lb. should be able to compete easily with new synthetics. At a lower price, the synthetic-natural would be uneconomic to produce, he said.

The following table provides an indication of the trend of Malayan rubber exports over the past three years (figures in tons):

	1958	1959	1960
UK	190,880	159,333	164,373
USA ..	134,967	169,681	119,517
Japan ..	110,738	120,788	95,711
West Germany	79,769	89,836	95,808
USSR ..	68,107	165,730	71,456
France ..	52,084	63,901	67,562
Italy	50,078	50,367	57,091
Poland ..	39,333	30,451	39,544
China ..	64,036	49,532	29,507
Australia ..	30,411	33,042	31,758
Czechoslovakia	16,202	14,879	31,125
Canada ..	25,925	34,202	24,730
Argentina ..	26,010	22,238	23,687
Spain ..	18,081	19,519	23,379
India.. ..	11,565	13,950	23,195
Sweden ..	17,469	19,180	21,381
South Africa..	18,395	19,270	17,202
Netherlands..	17,341	13,576	17,150
Yugoslavia ..	7,269	5,480	13,656

High Yielding Clones for Nigeria

Malaya's rubber industry has just made a lasting impression on the Prime Minister of Eastern Nigeria, Dr M. I. Okpara, who has been visiting the Federation. He believes that the whole face of his country would change if it could adopt Malayan methods and know-how on its rubber estates.

After visiting three Dunlop estates, Dr Okpara said the advances in the rubber industry here were far greater than anything he had seen before. He said it was incredible when told that many estates were producing as much as 1,500lb. an acre.

Eastern Nigeria has 40,000 acres under rubber — 30,000 acres held by overseas companies and 10,000 acres owned by the Government.

It is believed that Dr Okpara asked the Malayan Government for some of her high yielding rubber clones. He announced that the Eastern Nigeria Government had no plans for nationalizing its rubber estates, but they were anxious to improve Government-owned estates so that they could compete more successfully with the privately-owned ones.

For several days Dr Okpara talked to planters, leaders of the rubber industry here, Government ministers and saw replanting schemes, the making of concentrated latex and foam rubber.

Rubber Dealer Kidnapped

A wealthy Chinese rubber dealer here, Lee Puan Swee, 63, was released three days after being kidnapped. It is believed that his family paid about £5,000 for his release.

Mr Lee was kidnapped by armed thugs while visiting one of his estates near Klang, 21 miles from Kuala Lumpur.

Montreal Conference

Textiles as applied to the rubber industry will be discussed next month at the rubber chemistry division's sessions during the 44th Canadian Chemical Conference and Exhibition of the chemical Institute of Canada. The conference will be held in Montreal.

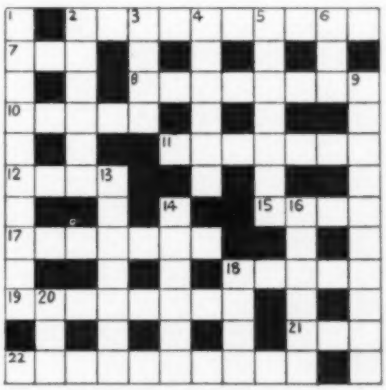
One of the papers in another session will be delivered by E. W. Madge, of the Dunlop research centre, Birmingham. It will be on *cis*-polybutadiene.

Safety Footwear

The North British Rubber Co. of Edinburgh and Dumfries has recently increased its range of safety protective footwear. This now comprises thigh boots, wellingtons (knee and short-legged) and ankle boots.

Among the newcomers is Rocksafe (short-knee length), which has a steel toe-cap to BSI Grade A1 specification, as well as a steel midsole. The vamp is reinforced. Another short knee safety wellington is Rockwear made to the same specification, but with vulcanite midsole.

RPW CROSSWORD



CROSSWORDS No. 79

CLUES ACROSS

2.—1 down is often used for this.
7.—SBR is extended with this.
8.—Sponge rubber is with large expansion though a convict is not so lucky (4, 4).
10.—Mother is first for the bird.
11.—A selection except on the outside.
12.—Combines with formaldehyde to form a resin.
15.—Little science starts the mark.
17.—Basin and a helmet.
18.—This is often smoked.
19.—Show the way again.
21.—Rubber rings go wrong inside.
22.—Latex is with acid.

CLUES DOWN

1.—Soft material made from latex (4, 6).
2.—Hackneyed phrase.
3.—DPG's rate of cure could be described thus.
4.—Used by mountaineers when it's freezing (3-3).
5.—The centre around which aggregates form.
6.—Nothing.
9.—The deserter gets in the books.
13.—Permanent.
14.—Rescind.
16.—Gum often is but cut down finally.
18.—Let it stand.
20.—Personality.

(Solution appears on page 68)

Rubber and Plastics Stock Market

A REVIEW OF PRICES AND TRENDS

'THEY'VE never had it so quiet'. This was one broker's comment just recently when asked how business was going. A fair summing up in my opinion of how shares have fared over the past couple of weeks. There has certainly been no marked revival in prices. Investors remain very cautious and buyers these days are more notable for their absence than anything else. The sharp comments from the Chancellor of the Exchequer recently which are expected to be backed up by action soon has put a brake on business. So have the developments in Kuwait.

Everyone is now waiting for the next move of Selwyn Lloyd. Until he has shown his hand it is difficult to forecast the outlook for shares. With this threat overhanging the scene plus the growing warning from company chairmen about shrinking profit margins it seems likely that equities will remain in the doldrums for the time being. There is, however, one significant factor worth noting at this juncture. The institutions are not yet switching out of good class ordinary shares into fixed interest stock. For three very good and sound reasons. 1. Rising costs and heavy wage demands at home have again headlined the risk of inflation. 2. The rising demand for equities. 3. Profits overall may be lower this year but it is unlikely that companies will cut their dividends — except as a last resort.

Topping our list of news from the boardrooms we spotlight COURTAULDS who for the first time have made public their sales figures. An impressive reading they make too for in the last trading year ending March 31 1961 they totalled a handsome £172m. compared with £140m. in the previous period. In a huge summing up of the group's interests which now spread far out from textiles, plastics and chemicals were both given a mention. About plastics it was stated that the division of BRITISH CELANESE was able to increase its turnover and profits.

Shareowners of FRANCIS SHAW must have also been more than satisfied with the chairman's annual review. For his view about the outlook for the company is that a good level of profits can be achieved in the current year. The group has a good order book and it was pointed out that the works are modern and well equipped. During last year progress was made in developing additions to the firm's range of machines, especially for the plastics industry, and the directors intend to apply still more effort in that field. Development costs of manufacture of prototypes of new machines will be a continued charge on trading profits.

Shock from DAVID BRIDGE who announced that the interim dividend was to be cut from 7½% to 5%. Sadly the board announced that current trading results had been adversely affected

Continued on page 65

Share Price Movements

Par Value	Company	1961 High	Low	June 24	Latest
£1	A.E. Ind. Ord.	48/6	39/6	40/6	39/9
5/-	Albright & W. Ord.	29/6	25/-	26/9	25/-
£1	„ „ „ 5% Pref.	17/3	13/6	14/6	14/-
5/-	Anchor Chemical Ord.	25/6	16/-	23/9	21/-
4/-	Airfix	52/6	34/6	50/6	51/-
4/-	„ Non Voting	50/-	33/6	49/-	48/-
5/-	Andersons Rub. Ord.	—	—	3/9	3/9
£1	Angus Geo. Ord.	83/-	58/6	76/-	71/-
5/-	Ault & Wiborg Ord.	34/-	25/9	30/-	30/-
£1	Avon India Rubber Ord.	46/6	30/-	38/3	38/9
£1	„ „ „ 6% Pref.	19/3	18/-	18/-	18/-
10/-	Bakelite Ord.	66/3	42/3	57/6	51/3
£1	„ 6% Pref.	19/3	16/6	17/6	17/6
£1	Baker Perkins Ord.	59/6	40/6	56/3	53/-
4/-	Bank Bdg. Rubber Ord.	3/6	1/9	2/3	2/3
4/-	Bettix	11/9	7/6	10/6	10/6
4/-	Brammer H. Ord.	17/-	15/9	16/3	16/3
10/-	Bridge, David Ord.	60/-	32/6	49/-	32/6
5/-	Bright, John Ord.	9/6	7/-	17/6	8/3xc
5/-	Brit. Blting & Asb. Ord.	24/-	17/6	22/9	22/3
£1	„ „ „ „ Pref.	—	—	15/9	15/9
5/-	British Electronic Indus.	15/6	11/3	11/6	11/3
2/-	Brit. Ind. Plas. Ord.	14/-	7/9	13/9	13/9
2/-	„ 10% (tax free) Pref.	9/9	4/3	9/9	9/9
£1	British Xylonite Ord.	93/-	63/-	93/-	93/-
£1	„ „ 5% Pref.	18/9	14/-	15/-	15/-
£1	BICC Ord.	62/6	50/3	60/9	58/6
5/-	BTR Ind. Ord.	19/9	12/-	13/-	12/-
£1	„ „ 7½% Pref.	21/6	20/9	21/3	21/-
£1	Courtaulds Ord.	47/6	35/-	38/6	36/-
£1	„ 5% 1st Pref.	16/-	14/6	15/6	14/9
£1	„ 6% 2nd Pref.	18/3	16/-	17/9	16/9
4/-	Cow, P. B. Ord.	10/6	7/6	10/1½	9/7½
£1	„ „ 5% Pref.	14/3	13/3	13/6	13/6
1/-	Dannimac Mfg. Ord.	15/3	12/-	14/3	13/9
10/-	De La Rue Ord.	70/-	56/-	59/9	57/6
£1	„ „ „ 3½% Pref.	10/6	9/6	9/6	9/6
10/-	Distillers Co. Ord.	42/3	30/-	34/3	35/9
£1	„ „ 6% Pref.	20/3	17/6	18/9	17/9
£100	„ 5% Conv. Loan	£96	£90	£92½	£92½
£100	„ 5½% Unsec. Loan	£86½	£77	£79½	£78½
10/-	Dunlop Rubber Ord.	29/-	21/6	25/6	26/-
£1	„ „ 5½% Pref.	16/-	14/6	15/9	15/-
£100	„ 3½% 1st Debs.	£69	£67	£68	£68
£100	„ 4½% 2nd Debs.	£79	£76	£79	£78
£1	Eng. Elect. Ord.	40/6	32/3	35/6	33/9
4/-	Ebonite Cont. Ord.	8/6	6/-	6/3	7/6
£1	English China Clays Ord.	117/6	80/-	106/6	97/6
£1	Goodyear Tyre 4% Pref.	11/6	10/9	11/3	11/3
5/-	Greeff Chem. Ord.	37/6	22/9	31/9	31/-

Par Value	Company	1961 High	Low	June 24	Latest
10/-	Greeff Chem. 5½% Pref.	8/3	7/3	7/6	7/6
4/-	Greengate & Irwell Ord.	6/9	5/-	6/9	5/6
5/-	Hackbridge Hldg.	6/9	4/9	5/6	5/-
£1	Harrisons & Crosfield Dd.	57/6	48/9	54/3	51/-
1/-	Hunt & Moscrop Ord.	2/3	1/3	1/9	2/-
£1	Imp. Chem. Ord.	81/6	63/-	71/9	69/9
£1	„ „ 5% Pref.	16/3	14/-	15/-	15/-
£100	„ 4½% Unsec. Loan	£83	£78	£80	£79½
£100	„ 5½% Conv. Loan	£93	£86	£88	£86
1/-	Kleemann (O. & M.) Ord.	21/3	8/3	18/9	18/9
£1	„ 6½% Pref.	22/3	16/3	22/3	22/3
5/-	Laporte Ind. Ord.	30/9	24/-	28/9	26/9
£1	„ „ 7½% Pref.	23/-	21/3	21/3	21/3
£1	Leyland & Birm. Rubber Ord.	59/3	46/3	55/-	53/9
£1	„ „ „ 6% Pref.	18/9	15/-	17/6	15/7½
2/-	London Rubber	15/6	9/6	15/6	14/3
£1	„ 6% Red. Cum. Pref.	20/-	16/9	16/9	16/9
£1	McKechnie Bros. Ord.	64/6	53/6	63/9	63/9
£1	„ „ 'A' Ord.	67/6	52/6	66/3	66/3
£1	„ „ 6% Cum. Pref.	18/-	16/-	16/6	16/6
5/-	Monsanto Chem. Ord.	27/6	21/9	21/9	21/9
£1	„ „ 3½% Pref.	12/6	11/6	12/-	12/-
£100	„ „ 6% Debs.	£98	£90	£92½	£90
5/-	Miles (H.G.) Hldgs. Ord.	7/9	7/-	7/6	7/6
2/-	Movitex	—	—	6/3	5/7½
£1	North British Rubber	21/3	13/-	14/-	13/-
5/-	Northwestern Rubber	13/-	9/-	12/-	12/-
5/-	Plastic Enginrs. Ord.	40/-	28/6	40/-	39/6
10/-	Projectile & Eng. Ord.	50/6	22/6	42/6	39/6
5/-	Redfern Holdings Ord.	3/9	2/9	2/10½	2/10½
2/-	RFD Ltd. Ord.	6/3	3/6	5/6	4/9
£1	„ „ 5½% Pref.	15/-	12/6	12/6	—
2/-	Rubber Imp. Ord.	6/3	3/3	3/6	3/6
2/-	„ „ 'A' Ord.	5/-	2/9	2/9	2/6
£1	„ „ 5% 1st Pref.	13/3	11/3	12/3	12/3
5/-	Rubber Reg. Ord.	18/3	16/9	18/-	18/-
4/-	Shaw Francis Ord.	24/6	14/-	17/6	14/6
2/-	Silentbloc Ord.	10/6	8/3	9/6	9/6
5/-	Storey Bros.	46/-	35/-	39/6	37/9
2/-	Sussex Rubber Ord.	2/7½	1/9	2/-	1/9
5/-	Sutcliffe Speak Ord.	18/6	13/6	18/3	17/-
£1	Tootals	35/6	28/-	31/6	30/3
£1	Turner & Newall Ord.	78/-	55/-	67/9	63/-
£1	„ „ „ 7% Pref.	21/6	19/3	20/6	19/9
5/-	Universal Asbestos Ord.	27/-	21/3	24/9	23/6
5/-	Viscose Dev. Ord.	16/3	13/3	15/9	14/9
5/-	Warne W. (Holdgs.) Ord.	21/6	14/9	21/3	21/3

Rubber Markets

LONDON

Uninteresting conditions characterized the market. Values largely followed the trend at Singapore, and overall fluctuated rather narrowly. Although there was a dearth of new orders, sellers did not press. Short-covering stimulated by the Kuwait and Berlin developments, relieved dullness of the terminal market, but the turnover was small.

Latest prices are as follows:

No. 1 RSS Spot: 24⅜d.-25d.

Settlement House:

August 24⅞d.-25d.
September 24⅞d.-25d.
October 24⅞d.-25d.
October/December 25d.-25⅛d.
January/March 25⅛d.-25¼d.
April/June 25⅛d.-25¼d.

No. 1 RSS cif basis ports:

July 24½d.-24⅝d.
August 24⅝d.-24⅞d.

Godown:

July 83¾ Straits cents nominal.

LATEX

Centrifuged 60% latex per gallon in drums, seller, August, 14s. 5d., cif European ports. Spot, seller, 14s. 10d. Bulk, seller d.w. 14s. 3d. Normal, seller, August, 11s. 6d.

NEW YORK

The New York rubber market ruled as under on July 3:

DEALERS' PRICES

	US cents per lb., ex-dock	
	July 3	Previous
No. 1 RSS, July	28⅞b–29⅛a	28⅞b–29⅛a
Aug.	28⅛b–29⅛a	28⅛b–29⅛a
No. 2 RSS, July	28⅛b–29⅛a	28⅛b–29⅛a
Aug.	28⅛b–29a	28⅛b–29a
No. 3 RSS, July	28⅛b–29a	28⅛b–29a
Aug.	28⅛b–28⅞a	28⅛b–28⅞a
No. 1 RSS, Spot	—	—
No. 3 amber blanket crepe, July	—	—

FUTURES—REX CONTRACT

	July 3	Prev. Close
July ..	28.90b–29.40a	29.30b–29.50a
Sept. ..	28.75b–28.90a	28.75b–28.90a
Nov. ..	28.55b–28.70a	28.60b–28.75a
Jan. ..	28.50b–28.60a	28.42b–28.59a

Sales: 11. Tendency: Steady.

Futures were about steady in quiet dealings on July 3. Physical rubber was quiet and featureless. In late trading futures were quiet and steady.

SINGAPORE

Some shortcovering at the opening on July 3 held prices steady, but upcountry sellers soon appeared and prices eased in thin trading. Better buying interest developed at the lower levels and the morning session finished on a quiet note. The market was very quiet in the afternoon. There was little interest noted in lower sheets.

	Malayan cents per lb., fob Malayan ports to open ports	
	July 3	Prev. Close
No. 1 RSS, July ..	83⅝–83¾	84¼–84⅜
Aug. ..	83¼–84	84⅜–84½
No. 2 RSS, July ..	83¼–83½	83⅞–84¼
No. 3 RSS, July ..	82⅝–82⅞	83 –83⅛
No. 4 RSS, July ..	79¼–80	79⅞–80⅛
No. 5 RSS, July ..	70¼–71¼	71 –72
No. 1 RSS, Spot ..	83⅛–83⅜	84 –84⅜
No. 3 blanket thick remilled crepe, July	70 –71	70¼–71¼
No. 1 fine pale crepe, July	91¼–93	91½–92½
2x thin brown crepe, July	67¼–68¼	67½–68½

Tendency: Very quiet.

The Industries Syndicate quote latex, native produce, 60% centrifugal, packed in rectangular drums, fob, at 163.80d. per gallon.

AMSTERDAM

The Amsterdam rubber market ruled as under on July 3:

	Guilders per kilo	
	July 3	Previous
No. 1 RMA		
July	2.30	2.30
August	2.30	2.30
September ..	2.30	2.30
July/September ..	2.30	2.31
October	2.31	2.31
November	2.31	2.31

Sales: Nil.

DJAKARTA

	Rupiahs per kilo
	July 3
No. 1 Priok, Spot	32.75b
No. 2 Priok, Spot	31.75b
No. 3 Priok, Spot	30.75b
No. 1 fine pale crepe, Spot	29.00b

Tendency: Steadier.

CEYLON

The price of No. 1 RSS at Colombo on July 3 was 100¼ (100¼) Ceylon cents per lb.

BANGKOK

The price of No. 1 RSS at Bangkok on July 3 was 27.12½ (27.12½) US cents per lb.

IRI Golf

Manchester Challenge Cup

THE Manchester section of the Institution of the Rubber Industry Golfing Society held its competition for the Manchester challenge cup, along with its invitation day, at the Wilmslow Golf Club recently.

A rather wet day did not detract from the enjoyment nor from the quality of the golf which was played.

At a dinner in the evening the captain, S. Heywood, welcomed 62 members and guests, and announced that the winner of the cup was A. Lord, with a net score of 66. The runner-up was L. R. Allanby, with a net score of 68.

Mr Heywood distributed to guests and members 19 additional prizes. The following members and firms of the Manchester section donated prizes.

T. A. Wilson, British Recovered Rubber and Chemical Co. Ltd.; F. M. Read, British Recovered Rubber and Chemical Co. Ltd.; H. West, West and Senior Ltd.; E. Bowker, Dunlop Rubber Co. Ltd.; N. Liddiard, International Synthetic Rubber Co. Ltd.; S. Heywood, Alfred Smith Ltd.; W. D. Porter, Goodyear Tyre and Rubber Co. Ltd.; D. Punton, Durham Raw Materials Ltd.; R. Ball, Hubron Rubber Chemicals Ltd.; H. K. Mills, Rubber Regenerating Co. Ltd.; E. Cheetham, The Whitehead Chemical Co. Ltd.; G. H. Robinson, Henry Gardner and Co. Ltd.; G. H. Manketelow, Hubron Rubber Chemicals Ltd.; S. Horabin, The Anchor Chemical Co. Ltd.; and A. Sanders, Rubber Regenerating Co. Ltd.

TMC at Wentworth

The Tyre Manufacturers' Conference held its annual golf tournament at Wentworth last week. There were 279 traders and manufacturers present, of whom 169 took part in the competition.

R. C. Hiam, president of the TMC presented the prizes, after welcoming the guests — in particular the presidents of the three associations who were present: A. W. Wright, Motor Agents' Association, J. T. Masterton, Motor Factors Association and W. H. Turner, National Tyre Distributors' Association.

STOCK MARKET

Continued from page 64

by a reduction in output. This was due in the main to delays in deliveries from sub-contractors as well as major suppliers of essential components. All added up to a big fall in the value of the shares since we last listed them as a glance at our price list (page 64) shows.

Industry INTELLIGENCE

Technical Data

Acrylic Emulsions

Imperial Chemical Industries Ltd. has published No. 9 of its series 'Synthetic Resins for Surface Coatings'. This deals with aqueous dispersions — Bedacryl 277, which is an anionic aqueous dispersion of a methacrylic copolymer containing approximately 50% non-volatile matter. It is designed for use as the binding medium for high-quality emulsion paints.

The pamphlet gives the pigmentation properties of Bedacryl and a graph depicting scrub resistance on plaster in relation to pigment volume concentration.

Copies of this booklet can be obtained from I.C.I. Dyestuffs Division, Blackely, Manchester.

Phenolic Foam

Considerable interest has been shown in phenolic foams by the building industry because of its outstanding fire retardant properties and high strength retention at elevated temperatures.

Bakelite Ltd., 12-18 Grosvenor Gardens, London S.W.1, has recently issued a new pamphlet on their foam material.

This lists the physical properties of the two standard densities, 2lb./cu. ft. and 3.5lb./ cu. ft. and a few selected applications are described and illustrated. The foam is clean, easy to handle, resistant to fungi and not attractive to vermin or insects. It has good thermal insulation properties and good chemical resistance.

Geon Polyblend 503

British Geon Ltd., Devonshire House, Piccadilly, London W.1, has recently issued a new information sheet No. G110 on Geon Polyblend 503, a colloidal blend of pvc and a butadiene/ acrylonitrile rubber.

When used for conventional pvc processing such as calendering or extrusion, Polyblend 503 behaves as a thermoplastic in which the nitrile rubber acts as a non-migratory plasticizer. It is also of value to the rubber industry for the production of ozone and oil resistant compounds, using normal rubber processing techniques, including vulcanization of the rubber phase.

Previously it has been necessary to flux a nitrile/pvc blend at temperatures in the region of 150° to 160°C. in order to achieve good ozone and sunlight resistance. This step is not necessary with Polyblend 503; additional nitrile rubber and curing ingredients can be blended in at normal process temperatures without loss of any physical properties.

The ratio of pvc to nitrile rubber is 55 : 45. Straight pvc resin of medium molecular weight is used and combined with rubber of medium-high acrylonitrile content (32-36%). Polyblend is supplied in the form of coarse amber granules.

Publications

Non-Black Fillers in SBR

The latest technical service note, No. 18, to be issued by Hardman and Holden Ltd., Manox House, Miles Platting, Manchester 10, deals with the use of Manosil VN 3 in low cost compounds based on SBR and oil extended SBR.

Manosil VN3 is a hydrated silica which can be used in blends with whiting or china clay to produce rubber compounds of equivalent quality to aluminium silicate reinforced compounds, yet at lower cost.

The technical service note gives the results of laboratory investigations carried out to date on the use of these filler blends in SBR and oil extended SBR compounds. Further work is being done on natural rubber compounds and on specific footwear compounds and literature will be published on the results of this as soon as they are available.

Epoxy Resin Floors

Since they are highly resistant to a wide range of chemicals and to abrasion, epoxy resins form an excellent basis for screeds for flooring. Ciba (ARL) Ltd., Duxford, Cambridge, technical note 222 describes a formulation of Araldite resin which is available for use with sand to give a hard floor with exceptional resistance to chemicals, particularly inorganic acids and alkalis.

The booklet describes the methods of mixing and laying of epoxy screeds which are being used with satisfactory results in a wide variety of chemical plant, spray shops, tanneries, food factories, dairies and breweries.

M.501 Calcined Clay

Calcined Clay is manufactured by The Mineral Products Division of English Clays, Lovering Pochin and Co. Ltd., St. Austell, Cornwall, a member of the ECC Group. A recently issued booklet describes the physical properties and industrial uses of M.501 as fillers for natural rubber, synthetic rubber, butyl rubber and pvc compounds.

M.501 is freely available from the company's new plant which is now in full operation, and said to be capable of producing and maintaining ample supplies of this reinforcing filler for both the UK and overseas markets. As M.501 is a white, finely ground powder, it is packed in strong bags to avoid contamination and wastage during transit.

Prices and samples are available on request and the company's technical service is willing to give further information and advice on the use of M.501 as a high quality reinforcing filler for rubbers and pvc.

Machines, Materials and Equipment

Acme Through-Press

HF Industrial Services Ltd. has recently introduced a large high frequency plastics welding press. The Acme 'Hundred-Series' through-press is at present available in three sizes, each having power output ratings of either 6kW. or 10kW. and electrode pressures of 2,300 or 5,000lb. according to requirements.

Actuation is hydraulic and the whole press is housed in a compact unit. Floor space has been cut to a minimum and the overall width, including press guides, is only 7in. greater than the press platen itself. All hydraulic equipment and high tension power supplies, together with the stabilized metal rectifiers, have been housed below the press platen and liquid cooling has been adopted for the oscillator valve which is housed in the upper section of the press. This method of cooling is claimed to save 15% on valve replacement cost.

Further information can be obtained from the company at 317-319 High Road, Wood Green, N.22.

Synthetic Rubber Prices

Prices of synthetic rubbers appear regularly in RUBBER AND PLASTICS WEEKLY *in the first week of each month. It will be appreciated if suppliers will give notification of any price changes or additions to their range. C/f duty paid quotations are subject to slight variation due to exchange, ocean freight and insurance fluctuations. Prices are in pence per lb., except where otherwise stated. Grades are expressed as follows:* 1001/2/6 = *grades* 1001, 1002 *and* 1006.

(e-qdp)—Ex-quay duty paid (cifUKdp)—cif UK duty paid (e-i)—Ex-installation (ddp)—Delivered duty paid (e-sUK)—Ex-store UK (ex-wUK)—Ex-warehouse UK (d)—Delivered BM—black masterbatch CBM—cold, black masterbatch CNP—cold, non-pigmented CNS—cold, non-staining COE—cold, oil extended COELC—cold, oil extended, light coloured CO/BM—cold, oil/black masterbatch CPOE—cold, pigmented, oil extended CRE—cold, rosin extended dw—Dry weight HN—high nitrile HNP—high nitrile, powder HP—hot, pigmented HS—high styrene HMW—high mol. wt. LMW—low mol. wt. MHN—medium high nitrile MLN—medium low nitrile MMW—medium molecular weight MN—medium nitrile NS—non-staining TS—total solids RTV—room temp. vulc.

SBR TYPES AND HIGH-STYRENE RUBBER

Ameripol (Goodrich Gulf) (e-qdp)

1000/1/6/7	Hot, non-oil ..	22.50
1002/12	,, ,, ..	22.75
1009	,, ,, ..	24.25
1011	,, ,, ..	23.25
1013	,, ,, ..	23.50
1019	,, ,, ..	24.75
1006/12	Hot, crumb ..	23.00
1009	,, ,, ..	25.00
1013	,, ,, ..	24.00
1500/1/2/9/11	Cold, non-oil ..	22.50
1605	BM, cold, non-oil ..	18.75
4658	,, ,, ,, ..	19.25
1606/8	,, ,, ..	18.25
1609	,, ,, ..	20.25
1610	,, ,, ..	18.75
4651	,, ,, ..	17.75
4600G2, 4604	Cold, non-oil	22.50
1703	COE, 25% oil	19.75
1705	,, ,, ,,	19.50
1707/8	,, 37.5% ,,	18.25
1710/12	,, ,, ,,	18.00
4700	,, 50% ,,	16.75
4760	COBM, 17.5% oil ..	16.25
1805	,, 37.5% oil ..	16.00
1809	,, ,, ,, ..	15.75
4756	,, ,, ,, ..	15.75
4759	,, ,, ,, ..	16.25
1808	,, 50% ,, ..	15.25
4758	,, 62.5% ,, ..	15.00

ASRC (American Synthetic Rubber Corpn.) (e-sUK)

1004/6	Hot, non-oil	22.25
1009	,, ,, ...	24.0
1018	,, ,, ...	24.75
1019	,, ,, ...	24.5
1500/2/7	Cold, non-oil	22.25
1503	,, ,, ...	24.25
1703	COE	20.5
1708	,, ...	18.0
1712	,, ...	17.75
1713	,, ...	16.75
3014	Hot, non-oil	25.75
3105/6	Cold, non-Oil	22.25
3110	,, ,, ...	24.0

Cariflex (Shell Chemical) (e-sUK)

S-1000	Hot	22.25
S-1002	,, ...	23.375
S-1006	,, ...	22.25
S-1009/11/13	,, ...	24.0
S-1500/2/9	Cold	22.25
S-1600/2	CBM	19.625
S-1605	,, ...	19.375
S-1606	,, ...	18.75
S-7652	,, ...	20.0
S-1703	COE	19.25
S-1707	,, ...	18.0
S-1709/12	,, ...	17.75
S-1803	COBM	17.875
S-1806	,, ...	16.625
S-1807	,, ...	17.375
S-1808	,, ...	15.25

Contract terms available.

FR-S (Firestone) (delUK*)

1000/1/4/6/7 and 195	Hot ..	22.50
1500/2 and 146	Cold	22.50
1703 and 173	OE ..	19.11
1710/12 and 184	,, ..	18.00
178	,, ..	18.25
201	,, ..	16.71
1009 UK Specialty	....	23.06
1012 ,, ,,	....	22.59
1013 ,, ,,	....	23.59
1014 ,, ,,	....	26.18
181 ,, ,,	....	22.50
182 ,, ,,	....	23.29
147 ,, ,,	....	20.94
158 ,, ,,	....	28.00
158-S	....	27.50

*Import Duty not included

Int. Synthetic Rubber (d)

Intol 1500/2	22.5
Intol 1509	22.5
Intol 1570	23.5
Intol 1006	22.5
Intol 1710	18.0
Intol 1712	18.0
Intol 1778	18.25

Naugapol (Naugatuck Chemical International) (ex-WUK)

1016/9	28.5
1018	29.0
6003	29.0
1022	32.25
1023	34.5
1503	28.25
6102	28.25
1504	36.5
6101	24.5
6100	33.5
K-45	28.25
K-50	28.75
KO-50	29.25
1015	36.5
6004	27.0

ANIC (e-qdp)

1500	22.25
1502	22.25
1708	18.00
1712	17.75
6630	23.25
6632	22.25
6700	16.375

Philprene (Phillips) (d)

1000/6	Hot, non-pig.	22.50
1009	,, ,, ...	24.25
1018	,, ,, ...	26.97
1019	,, ,, ...	26.50
6701	,, ,, ...	24.23
1500/2	CNP	22.50
1503	,, ...	26.27
6630	,, ...	25.18
6632	,, ...	24.23
1601	CP	19.70
1603	,, ...	19.80
1605	,, ...	19.625
1606	,, ...	19.00
1608	,, ...	18.90
1609	,, ...	21.12
6662	,, ...	18.90
6655	,, ...	19.80
1703	COE	20.75
1708	,, ...	18.25
1712	,, ...	18.00
6700	,, ...	18.01
1803	CPOE	18.125
1805	,, ...	16.11
1808	,, ...	16.50
6608	,, ...	15.27
6753	,, ...	15.61
6754	,, ...	15.45
6755	,, ...	17.68

Plioflex (Goodyear) (ex-wUK)

1006	HNP	22.25
1500/2/7/8	CNP	22.25
1006	S	22.75
1703	COE	19.25
1710/12	,, ...	17.75
1773	COELC	19.25
1778	,, ...	18.0
B—6	....	27.5
B—5	....	28.0

Polysar (Polymer UK) (e-sUK)

S Hot	22.25
S-630 Hot	22.25
Kryflex 200 Cold	23.5
Krylene	22.25
Krylene NS	22.25
Krylene 602 Cold	22.25
Krynol 651 COE	17.75
Krynol 652 ,,	18.0
S-X 371 Process Aid	24.0

Synpol (Texas-US Chemical) (e-qdp)

1000/1	Hot	22.25
1002	,, ...	22.47
1006/7	,, ...	22.25
1009	,, ...	22.81
1012	,, ...	22.38
1013/61	,, ...	22.25
X274	,, ...	23.45
8000	,, ...	22.25
1500/02/51	Cold	22.25
1703	COE	19.25
1707/8	,, ...	18.0
1711	,, ...	17.88
1712	,, ...	17.75
8200	,, ...	18.0
8201	,, ...	16.6
8202	,, ...	16.38
8152	CBM	18.6
8151	COBM	18.2
8253	,, ...	15.84
8254	,, ...	15.45
8255	,, ...	14.8
8267	,, ...	16.4

(Masterbatch prices US cents per lb. fas Gulf ports)

SBR LATICES

Copo (Copolymer) (cifUKdp)

(10-ton lots)		
2101	(dw)	46.3
X-765	,, ...	40.8
X-800	,, ...	37.2
2102/5	,, ...	38.0

Ciago

SB75	38.00
SB69	36.00
SB57P BM	27.50
SB58P	29.75

Pliolite Rubber (Goodyear) (d)

2000	40

Latex (dw)

2001/4/5/8	40
5350	40

Pliolite Resin (Goodyear) (d)

101A (dw)	44
150 ,, ...	50
151 ,, ...	35
160 ,, ...	50
170 ,, ...	50

Hycar (B. F. Goodrich) (ddp)

2507 (HS) dw	48

Polysar (Polymer UK) (e-sUK)

Latex, type IV	32.5 TS
Latex, type 722	31.75 TS
(Non-returnable 45-gallon drums)	(e-i)
Latex, type 722	28.75 TS
(bulk quantities)	

Int. Synthetic Rubber (ex-wks)

Intol Latex M23B/R23/F28	22.25
Intol Latex 62A	27.0

Dylex (Koppers Int. CA) (fas)

K-42A/52/31/900	31.6

ACRYLONITRILE TYPES

Butaprene N (Firestone) (cifUKdp)

NL	52.5
NAA	56.25
NF	51.5
NXM	60.18

Chemigum (e-s)

N—1	75
N—3A	52
N—5	52
N—6G/7/8/600X	45

Hycar (British Geon) (UKd)

(500-lb. lots and over)		
1001	High Nitrile Hot	52
1041	,, ,, Cold	52
1002	MHN Hot	45
1042	,, Cold	45

Hycar (B. F. Goodrich) (ddp)

(500-lb. lots and over)		
1411	HNP	66
1432	MHN (crumb)	64
1072	,, (carboxyl)	66
1312	,, (liquid)	55
1043	MLN	51
1014	Low Nitrile	61

I.C.I. (min., 5-cwt. lots) (UKd)

Butakon A-4051 HN Cold .	52
Butakon A-3051 MN Cold .	45
Butakon A-3002 ,, ,, .	45

Paracril (US Rubber) (dwe-sUK)

18-80	Low Nitrile	61
AJ	,, ,, ...	50
B	MLN	51
BJ	,, ...	51
BLT	,, Cold	51
BJLT	,, ,, ...	51
C	MHN	59
CLT	,, Cold	59
CV	,, (crumb)	63
D	High Nitrile	67
ALT	....	51
OZO	....	47

Polysar (Polymer UK) (d)

Krynac 800 MN	45
Krynac 802 LN	45
Krynac 803 MN (low Mooney)	45
Krynac 801 HN	52
Krynac 804 (MN-cross linked)	45

ACRYLONITRILE LATICES

Butaprene N (Firestone) (cifUKdp)

N-300 (dw)	53
N-400 ,, ...	60.5

Chemigum Latex (Goodyear) (d)

200	(dw)	65
235/6	CHS ,, ...	60
245	B ,, ...	52
245/6/7/8	CHS ,, ...	52

Ciago

AB61/71	60
AB62/77	52
217OH	60

Hycar (B.F. Goodrich) (ddp)

(dry weight, drum lots)		
1551	High Nitrile	66
1552	MHN	57

Hycar (British Geon) (UKd)

(dry weight, 3 drums and over)		
1561	High Nitrile	60
1571	,, ,, (carboxyl)	60
1562	MHN	52
1577	(modified)	52

ACRYLIC TYPES

Hycar (B. F. Goodrich) (ddp)

4021 Slab, 500 lb. and over.	144
4501 Latex, dry weight	96

BUTYL TYPES

Esso (e-sUK)

Regular 035/150/215	21.75
Regular 217/8	21.75
Regular 325	21.75
Non-staining 165	22.75
Non-staining 268	22.75
Non-staining 365	22.75

Polysar (Polymer UK) (e-sUK)

Butyl 100/200/300		21.75
Butyl 301/400	NS	21.75
Butyl 101	NS	26.25
Butyl 402	NS	22.5

Hycar (B. F. Goodrich) (ddp)

(500 lb. and over)	
2202 Brominated	68

NEOPRENES

(ddp)

W	(dwdel) ..	42.62
WHV	,, ...	38.5
WRT	,, ...	48.37
WX/GN/GNA	,, ...	44.62
GRT and S	,, ...	45.62
AC	,, ...	57.125
KNR	,, ...	75.62
AC 'M' and 'S'	,, ...	57.125
CG/AD	,, ...	57.125

The above prices refer to neoprene produced in the U.S.A. Prices of neoprene types produced at Du Pont's Maydown, Northern Ireland, plant are as follows:

W	(dwdel)	38.5
WRT	,, ...	44.0
WX	,, ...	40.5

Latices—Dry

(per lb. del, min., 50 lb.)	
571	49.75
842A	49.75
572	51.25
601A	51.87
650	54.125
735	51.25
736	51.25
950	58.25
60	51.87
750	51.25
635	53.62

SILICONE RUBBERS

Midland Silicones

(500-lb. lots del)	
Stocks	16s. 6d. to 35s.
Pastes	26s. to 35s.
Gums and base stock	36s. to 42s.
Cold-curing silicone rubber	20s. and 23d. 6d.

I.C.I. Silicones

Gums (40-lb. lots del)	39s. 6d.-47s.
Stocks (250-lb. lots del)	22s.-35s.
Pastes (1000-lb. lots del)	27s.6d.-35s.9d.
Silcoset (RTV) (250-lb. lots del)	21s. to 24s.

REINFORCING RESINS AND RUBBERS

I.C.I. (min., 2-ton lots) (UKd)

Butakon S-8551	36.5
Butakon S-7001	33.5

Hycar (B.F. Goodrich) (ddp)

2007 (powder)	42.5

Pliolite (Goodyear) (d)

S—6B	36.5

Polysar (Polymer UK) (e-sUK)

SS-250 HS (bale)	27.25
SS-250 ,, (flake)	27.5
Kryflex 252 HS	25.5
Kryflex 202 (HMW Cold polymerized)	25.75

Cariflex (Shell) (e-sUK)

SP-103	27.25

Cyclite (Durham Raw Materials) 42

HYPALON

(ddp)

20	48
30	60.25
40	50.75

TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from 'The Trade Marks Journal'—given below are reproduced by permission of the Controller of H.M. Stationery Office.

Emfac (815,524). Chemical products used in industry. Unilever-Emery N.V., Buurtje 1, Gouda, Netherlands. (Class 1; May 24 1961.)

JEMCA MISTMASTA

(815,495). Films of transparent plastics for inhibiting the formation of mist on the windows and windscreens of vehicles. John Morgan (Jemca) Ltd., 59 Camden Street, Birmingham, 1. (Class 12; May 24 1961.)

Minipak (B809,236). Materials included in Class 17 in the form of sheets, tubes and rods, all being goods of laminations of synthetic plastics and regenerated cellulose. Hamac A.G., Bahnhofstrasse 5, Zug, Switzerland. (Class 12; May 24 1961.)

Papon (807,580). Expanded polystyrene plastics included in Class 17 in the form of sheets and shaped sections. Commerce Factors (GB) Ltd., Gallows Park, Torpoint, Cornwall. (Class 17; May 24 1961.)

(815,846). Plastics and articles made therefrom, all included in Class 17. Raychem U.K. Ltd., Highams Park, London, E.4. (Class 17; May 24 1961.)

Coronet (810,340). Hold-alls made of plastics for toilet articles. Boots Pure Drug Co. Ltd., 37 Station Street, Nottingham. (Class 18; May 24 1961.)

Parwinac (813,786). Doors of rubber and/or of plastics. Parker Winder and Achurch Ltd., 251 Broad Street, Birmingham, 1. (Class 19; May 24 1961.)

Cumfits (817,559). Rubber gloves for household cleaning purposes. Adams and Martin Ltd., 22 New Cavendish Street, London, W.1. (Class 21; May 24 1961.)

A contribution to industrial safety is made by this overhead power distribution railway, installed at the National Smelting Co. Ltd., Avonmouth. British Resin Products' Rockite phenolic extrusions provide the insulating covers for the busbars

NEW COMPANIES

Polplas Ltd. (694,918). June 8. Capital: £5,000 in £1 shares. To carry on the business of manufacturers and processors of, and dealers in, polythene and other plastics materials and goods, etc. The directors are to be appointed by the subscribers. Regd. office: 8 Southampton Row, W.C.1.

John Hellyar and Co. Ltd. (694,742). June 6. Capital: £5,000 in £1 shares. To carry on the business of importers, exporters, manufacturers of, and dealers in, plastics substances, etc. The directors are: John E. Hellyar and Cicely M. Hellyar, both of 116 Beltinge Road, Herne Bay. Regd. office: 230 Vauxhall Bridge Road, S.W.1.

Fibre Pad (Poyle) Co. Ltd. (694,726). June 6. Capital: £100 in 10s. shares. To carry on the business of manufacturers, processors, merchants, importers and exporters of, and dealers in, natural and man-made fibres and admixtures of such fibres; fibrous textiles, rubber and plastics, etc. The directors are: Walter H. Butcher, 'Three Counties', Ridgmead Road, Egham, Surrey; Hamilton C. Butcher, 'Grand View', Coopers Hill Lane, Egham, Surrey.

Mitco (Overseas) Ltd. (694,938). June 8. Capital: £100 in £1 shares. To carry on business as world distributors (excluding the Americas) of Mitco tyres, and the sale of plant for manufacturing Mitco tyres, etc. The directors are: Arthur J. Watts, Highfield, Lydney, Glos.; Lewis W. R. Morley, The Close, Belton Lane, Grantham. Regd. office: Gonerby Hill Foot, Grantham, Lincs.

Modern Laminates Ltd. (694,854). June 7. Capital: £5,000 in £1 shares. To carry on the business of manufacturers of, and dealers in, plastics, etc. The directors are: Albert J. Hills, 22 Denewood Close, Watford; Charles H. Furniss, Crosslea, The Nap, King's Langley. Regd. office: East Bay, The Bridle Path, Watford.

Winplay Plastics Ltd. (694,893). June 7. Capital: £100 in £1 shares. To carry on the business of manufacturers of, and dealers in, plastics, modelling and moulding materials, substances and compositions, etc. The directors are: Kenneth G. Brett and Valerie J. Brett, both of 'Fourwinds', Mizen Close, Cobham, Surrey; Dennis F. May, 50 Thames Evot, Cross Deep, Twickenham. Regd. office: 76 Cambridge Road, Kingston-on-Thames.

F.G.P. (Rayleigh) Ltd. (694,904). June 7. Capital: £5,000 in £1 shares. To carry on the business of manufacturers, producers, processors and workers of, and dealers in, glass fibre and synthetic resin materials, plastics modelling and moulding materials, etc. The first directors are to be appointed by the subscribers. Regd. office: The Laboratory, Rawreth Lane, Rayleigh, Essex.

Stendorn Plastics Ltd. (694,396). June 2. Capital: £100 in £1 shares. The first directors are to be appointed by the subscribers. Regd. office: 13 Well Court, Bow, E.C.4.

Tyres and Batteries (Redditch) Ltd. (694,584). June 5. Capital: £10,000 in £1 shares. To enter into any agreement which has already been prepared and expressed to be made on behalf of the company by Albert R. South. To carry on the business of manufacturers of, and dealers in, tyres and batteries, etc. The directors are: Albert R. South and Edith K. South, both of 2 Lowesmoor Place, Worcester. Regd. office: 2 Lowesmoor Place, Worcester.

Solution to RPW Crossword

(See page 63 this issue)

ACROSS.—2, Cushioning. 7, Oil. 8, Open cell. 10, Macaw. 11, Excerpt. 12, Urea. 15, Scar. 17, Basinet, 18, Sheet. 19, Redirect. 21, Err. 22, Coagulated.

DOWN.—1, Foam rubber. 2, Cliche. 3, Slow. 4, Ice-axe. 5, Nucleus. 6, Nil. 9, Literature. 13, Abiding. 14, Repeal. 16, Chewed. 18, Stet. 20, Ego.

Armabord Ltd. (694,799). June 7. Capital: £100 in £1 shares. To carry on the business of manufacturers of, and dealers in, plastics, etc. The directors are: Harry Abrahams, 24 Orchard Street, W.1; Alexander Abrahams, Broomfield, Esher Park Avenue, Esher. Regd. office: Grove Mill, Earby, Yorks.

Duralay Ltd. (F.4059). August 4 1959. Capital: £10,000 in £1 shares. To carry on business of general india rubber, synthetic rubber, gutta percha and other latices, plastics, asbestos, textile, leather and canvas processors and manufacturers, etc. The directors are: Thomas H. Roberts, Meadow Cottage, Forest Green, near Dorking; Thomas P. Fleming, 2 Glenvar Park, Blackrock, Co. Dublin; Roland K. Bootes, 803 Raleigh House, Dolphin Square, S.W.1. British address: 132/5 Sloane Street, S.W.1.

R G Tyres Ltd. (694,281). June 1. Capital: £10,000 in £1 shares. To carry on the business of manufacturers of, and dealers in, tyres, etc. The first directors are to be appointed by the subscribers.

Increases of Capital

Stephens Manufacturers Ltd. (421,115), 21/4 Chiswell Street, E.C.1. Increased on October 25 1960, by £5,000 in £1 ordinary shares, beyond the registered capital of £15,000.

British Xylonite Co. Ltd. (11,530), Highams Park, E.4. Increased on October 20 1960, by £2,500,000 in £1 ordinary shares, beyond the registered capital of £1,900,000.

Geta Plastics Ltd. (436,035), 14/18 High Holborn, W.C.1. Increased on October 5 1960, by £3,500 in £1 ordinary shares, beyond the registered capital of £1,500.

Manchester Rubber Manufacturing Co. Ltd. (393,852), Glen Works, Cornholme, Todmorden. Increased on September 28 1960, by £90,000 in £1 shares, beyond the registered capital of £10,000.

Boro Rubber Co. (1912) Ltd. (123,256), Smithy Bridge, Littleborough. Increased on September 28 1960, by £72,000 in £1 ordinary shares, beyond the registered capital of £28,000.

Isofoam Ltd. (593,481), Kingston Wharf, Brighton Road, Shoreham-by-Sea. Increased on October 8 1960, by £9,000 in £1 ordinary shares, beyond the registered capital of £1,000.

Basil Sherman Ltd. (642,315), plastics article manufacturers, etc., 97/99 Park Street, W.1. Increased on October 14 1960, by £900 in £1 shares, beyond the registered capital of £100.

Industrial Polymers Ltd. (502,143), 1 Avery Row, Grosvenor Street, W.1. Increased on September 23 1960, by £9,000 in £1 ordinary shares, beyond the registered capital of £1,000.

Halmatic Ltd. (669,397), plastics manufacturers, etc., 72 Wigmore Street, W.1. Increased on October 5 1960, by £9,900 in £1 ordinary shares, beyond the registered capital of £100.

Kinta Kellas Rubber Estates Ltd. (107,719), Adelaide House, London Bridge, E.C.4. Increased on September 29 1960, by £175,000 in 2s. shares, beyond the registered capital of £175,000.

Perak Rubber Plantations Ltd. (87,878), 4 Lloyd's Avenue, E.C.3. Increased on September 15 1960, by £150,000 in 2s. ordinary shares, beyond the registered capital of £100,000.

Changes of Name

C. Neild Tyre and Rubber Co. Ltd. (654,547), 781 Salisbury House, London Wall, E.C.2. Name changed to Provincial Tyre Co. (Newcastle) Ltd. on October 19 1960.

Vacuform Plastics Ltd. (650,915), Green Street, Alderley Edge, Cheshire. Name changed to Vacuum Formers Ltd. on October 24 1960.

M.G. Lacquers Ltd. (594,154), 19 Mincing Lane, Blackburn. Name changed to M.G. Plastics (Overseas Developments) Ltd. on September 12 1960.

Alan Barclay (Overseas) Ltd. (489,200), 13b Gore Road South, Southsea, Hants. Name changed to Alan Barclay (Plastics) Ltd. on September 14 1960.

Sussex Laminations (Sales) Ltd. (642,315), manufacturers of plastics articles, etc., 97/99 Park Street, W.1. Name changed to Basil Sherman Ltd. on September 23 1960.

Tyres, Bournemouth (1959) Ltd. (633,536), 7 Brunswick Place, Southampton. Name changed to Tyres (Croydon) Ltd. on October 5 1960.

C. W. Malcolm (Sales) Ltd. (555,434), 23 Welbeck Street, W.1. Name changed to P.I. Plastic Laminates Ltd. on October 13 1960.

CLASSIFIED ADVERTISEMENTS

RUBBER AND PLASTICS WEEKLY

APPOINTMENTS VACANT

6d. a word. Minimum 12/6 Box 2/-

APPLICATIONS are invited for the position—foreman extrusion department of a rubber company in Surrey. Pension and bonus schemes in operation.—Write in confidence, giving full details of age, experience and present salary to Box 1150. (1150)

ASSISTANT works manager required to train as works manager. Factory in North London employing approximately 200 on shift work. Previous practical works experience necessary and knowledge of soft rubber and/or plastics moulding advantageous. Age about 30/45. Commencing salary £1,500 or depending upon qualifications.—Details of education, past experience, positions held with dates to Box No. CL. 1673, Haddon's, Haddon House, 2/4 Fitzroy Street, London, W.1. (1120)

CHIEF CHEMIST required by JAMES HALSTEAD LIMITED

Applications are invited from graduates between the ages of 30 to 40 with knowledge of plastics and rubber industry. Good organiser to keep pace with rapidly developing company. Good salary paid commensurate with experience and qualifications. Pension Scheme in operation.—Write in confidence, giving details of age, experience and salary required to Managing Director, James Halstead Limited, Crow Oak Works, Whitefield, Manchester. (1159)

CHEMIST-TECHNOLOGIST required for rubber factory, responsible position, good opportunities, pension scheme.—Apply in confidence to Chief Chemist, Greengate and Irwell Rubber Co. Ltd., Greengate, Manchester, 3, stating age, experience and qualifications. (1167)

FACTORY manager (rubber manufacture) for a private company near Manchester employing about 250. He will be responsible to the Board for all aspects of production including engineering and planning. Starting salary in the range £1,600—£2,000 depending on experience. Pensions scheme and house available. Candidates 35-45 must have had several years' experience at manager level in the rubber industry. Able to handle experienced specialist staff. An engineering background would be an advantage.—Box 1162. (1162)

APPOINTMENTS VACANT

(continued)

Opportunities occur offering excellent prospects in a medium sized West Midlands rubber company for the following supervisory staff:—

1. Experienced moulding foreman to take complete charge of a small mechanised moulding section. Must be a good disciplinarian.
2. Practical foreman with spreading and proofing experience in the industry. Must be fully conversant with calenders.

Apply giving full details of age, experience and salary required, in strictest confidence, to Box 1163. (1163)

THE RUBBER REGENERATING CO. LTD.

HAS A VACANCY FOR A

SENIOR RUBBER TECHNOLOGIST

Basically the position carries responsibility for

- investigations into the compounding of natural and synthetic rubber (wet and dry) with particular emphasis on the application of reclaim, accelerators and anti-oxidants in rubber manufacture.
- the preparation of technical reports.
- contributing to the preparation of technical literature.

Applications, which will be treated in strict confidence, should give details of age, education, technical standard and experience and be addressed to:—

Personnel Manager,
Rubber Regenerating Co. Ltd.,
Trafford Park,
Manchester, 17.

(1169)

TECHNICAL APPOINTMENTS

REDFERN'S RUBBER WORKS LIMITED, HYDE, CHESHIRE

wish to appoint:

HEAD OF DEVELOPMENT

A high-calibre Technologist of wide experience and possessing commercial flair is needed to initiate and control work on development projects in this company and in collaboration with associated companies in the Redfern group.

Responsibilities would include overseas liaison. This is a top level appointment and will carry excellent prospects of a directorship.

SENIOR TECHNOLOGISTS

Well-qualified Technologists are required for:

(a) Compound development and process control and
(b) Product development activities.

There are excellent prospects of progress for men of initiative.

The company is engaged upon a programme of expansion in various markets, including specialized and general extrusions and mouldings.

Candidates are asked to give full details of their experience and to state preferences and salary required.

Applications, which will be treated in the strictest confidence, to:

Managing Director,
Redfern's Rubber Works Limited,
Hyde, Cheshire.

(1160)

APPOINTMENTS VACANT

LATEX TECHNOLOGIST

specializing in dipping required by an established rubber manufacturer in the London area. Good remuneration with pension scheme.

Write giving short detailed account of education and experience in fullest confidence to:—

Mr. C. R. Pinnell,
Works Director,
WILLIAM WARNE & CO. LTD.
Barking, Essex. (1135)

LATEX processes and applications. Through the expansion of all departments, it is desired to appoint an assistant to the works manager with special responsibilities in the section devoted to textile combining. To a young man with experience of laminating techniques using natural and synthetic latices, this is an unusual opportunity offering scope for promotion, and an attractive level of remuneration.—Application should be made in writing to Mr. F. Hill, Production Director, Durie and Miller Ltd., Haslingden, Rossendale, Lancs. (1161)

FOREMAN spreader with organising ability for small proofing works on north side of Manchester. Apply stating age and experience and present salary. Own staff informed.—Box 1151. (1151)

Development Engineer

25 - 35 years

Technical knowledge and experience in design and manufacture of all types of machine and hand built hose

●

Excellent prospects for advancement

Apply Employment Manager

The Goodyear Tyre & Rubber Co. (G.B.) Ltd. Wolverhampton

(1166)

APPOINTMENTS VACANT

MANAGEMENT OPPORTUNITY

A leading tyre retreading company in Nigeria has two management vacancies for men with sound experience of this section of the Rubber Industry.

The company is one of the biggest in its field and has been operating for over 10 years.

Assistant General Manager

The successful applicant (aged 25/40) will be responsible to the British General Manager for the general management of the company. He must have a sound knowledge of both tyre retreading processes and techniques. He must prove he has the ability to take over the general management of the company when the general manager retires. He will be based at Ibadan but will visit the other factories from time to time.

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